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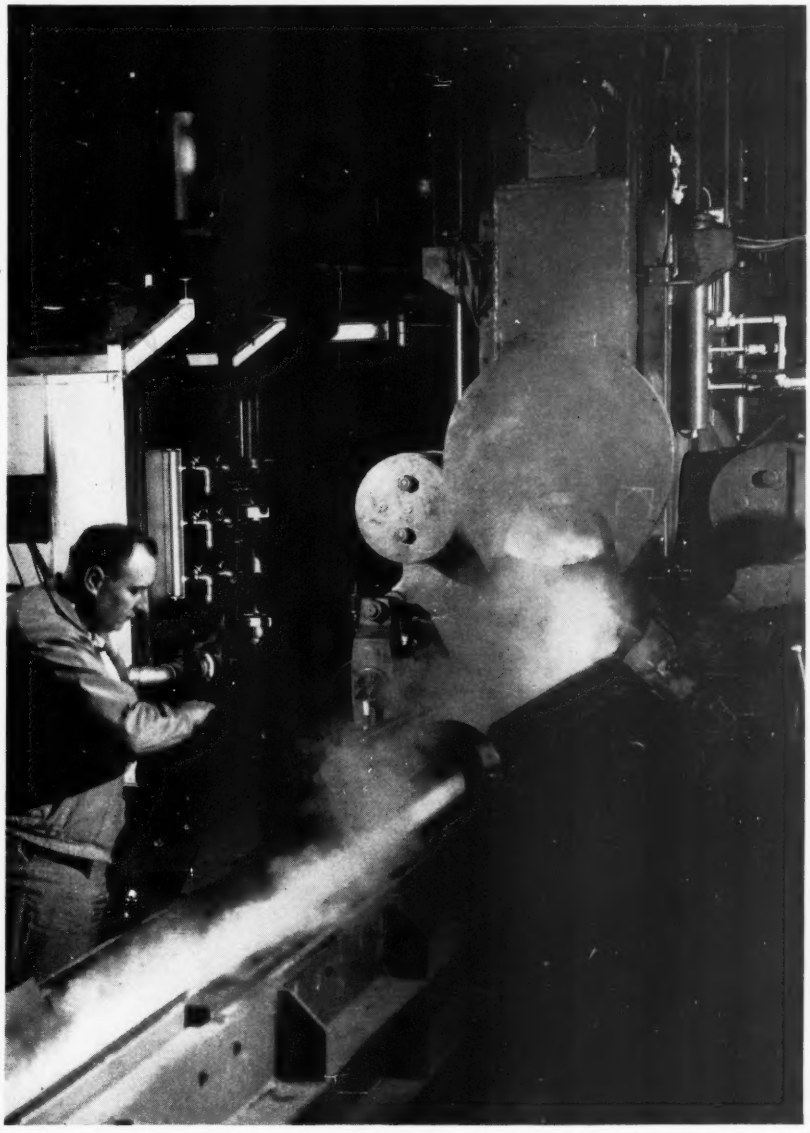
JUNE 2, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

UNIVERSITY
JUN 2 - 1952



HOT EXTRUSION

New method for producing stainless tubing and shapes Glass is the lubricant.

—see page 92

BUSINESS WEATHER, p. 63
Partly Cloudy, Say P.A.'s

ROOM AIR CONDITIONERS, p. 75
Strong Trade Wind in Appliances

MORE IRON FOR FOUNDRIES, p. 9
New Process Reclaims Borings

LATHE VIBRATIONS, p .99
Pinpointed by Electronics

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A 12403

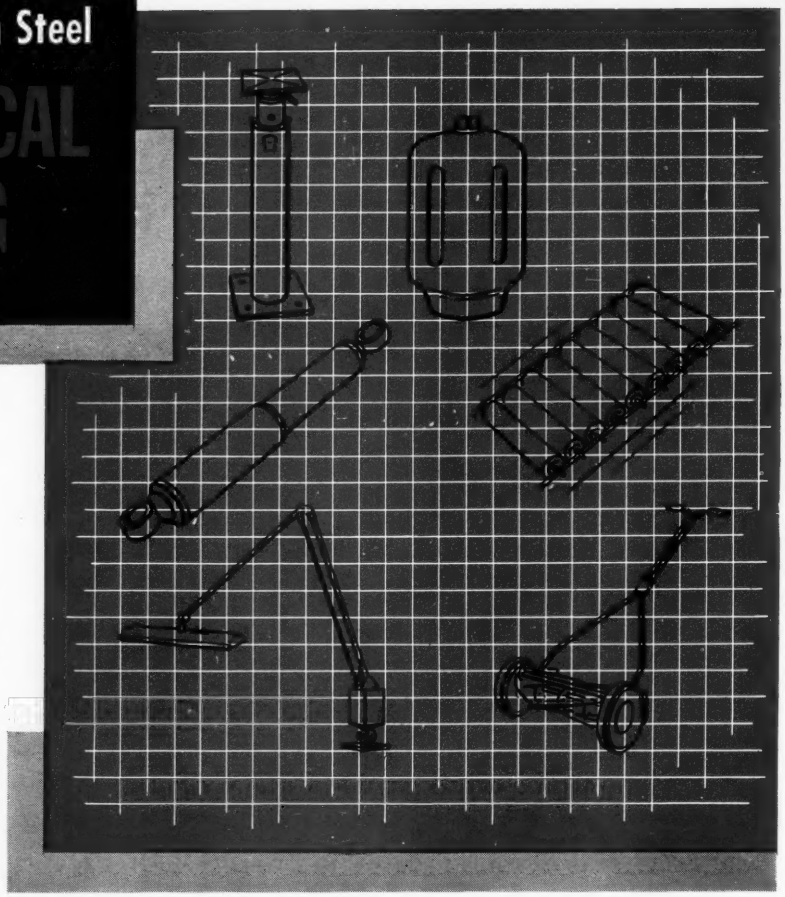
take a

CLOSER LOOK

at

B&W ERW Carbon Steel MECHANICAL TUBING

to



- . . . Simplify Product Design
- . . . Improve Appearance
- . . . Reduce Scrap Loss
- . . . Speed Fabrication
- . . . Save Final Finishing Time
- . . . Secure Maximum Economies
- . . . Obtain Higher Strength to Weight Ratio

B&W ERW tubes are made on the same modern mills (and by the same skilled craftsmen) that produce B&W welded pressure tubes which have for many years met the exacting requirements of boilers and other heat transfer apparatus. This inherent standard of excellence assures you the finest welded tubing to make hollow structural and machined parts. Write for Bulletin TB 333, a thrifty little booklet filled with cost-saving details. Or call in Mr. Tubes, your B&W Tube Representative, to help you match tubing economies and production efficiency.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

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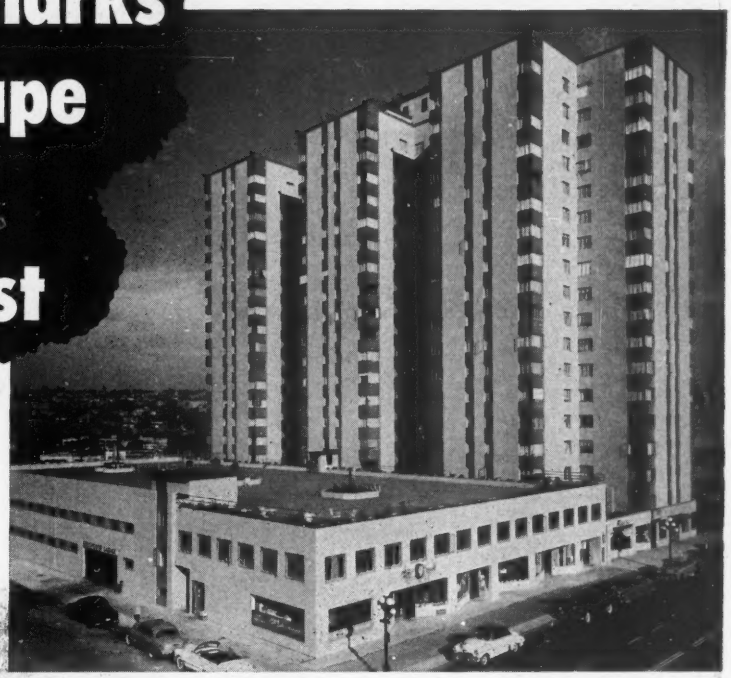
B&W SEAMLESS and WELDED TUBES

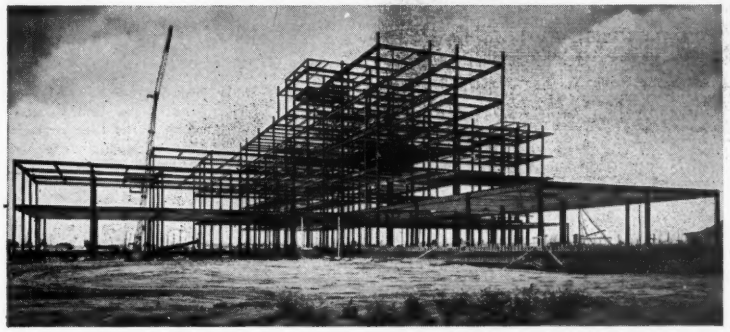
TA-1689M

New Landmarks Taking Shape Along the Pacific Coast



SEATTLE — Grosvenor House, an 18-story reinforced-concrete building with 370 apartments, 19 stores, garage, and roof garden. 1500 tons of reinforcing steel used in the floors and 35 miles of Rayduct steel pipe for the radiant-heating system were furnished by Bethlehem Pacific.

Earl W. Morrison, *Architect;* W. H. Witt Company, *Structural Engineers;* University Plumbing and Heating Company, plumbing, heating and ventilating systems.



SALINAS—The Salinas Valley Memorial Hospital in Monterey County, California. Built along functional lines, this structure will have 108,470 sq ft of floor area. In addition to patients' rooms and operating rooms, it will have allergy rooms, clinical laboratories, and extensive X-ray rooms.

Bethlehem Pacific fabricated an... erected the 560 tons of structural steel in this building. Robert Stanton, *Architect;* Parker, Steffens & Pearce, *General Contractors.*

SAN LEANDRO—Addition to the San Leandro, California, plant of the Dodge Division of the Chrysler Corporation. This 2-story building will provide 690,000 sq ft of floor area, automobile storage, and assembly lines. It contains more than 4500 tons of structural steel fabricated and erected by Bethlehem Pacific.

Swinerton & Walberg, *General Contractors;* George H. Miehls, *Structural Engineer.*

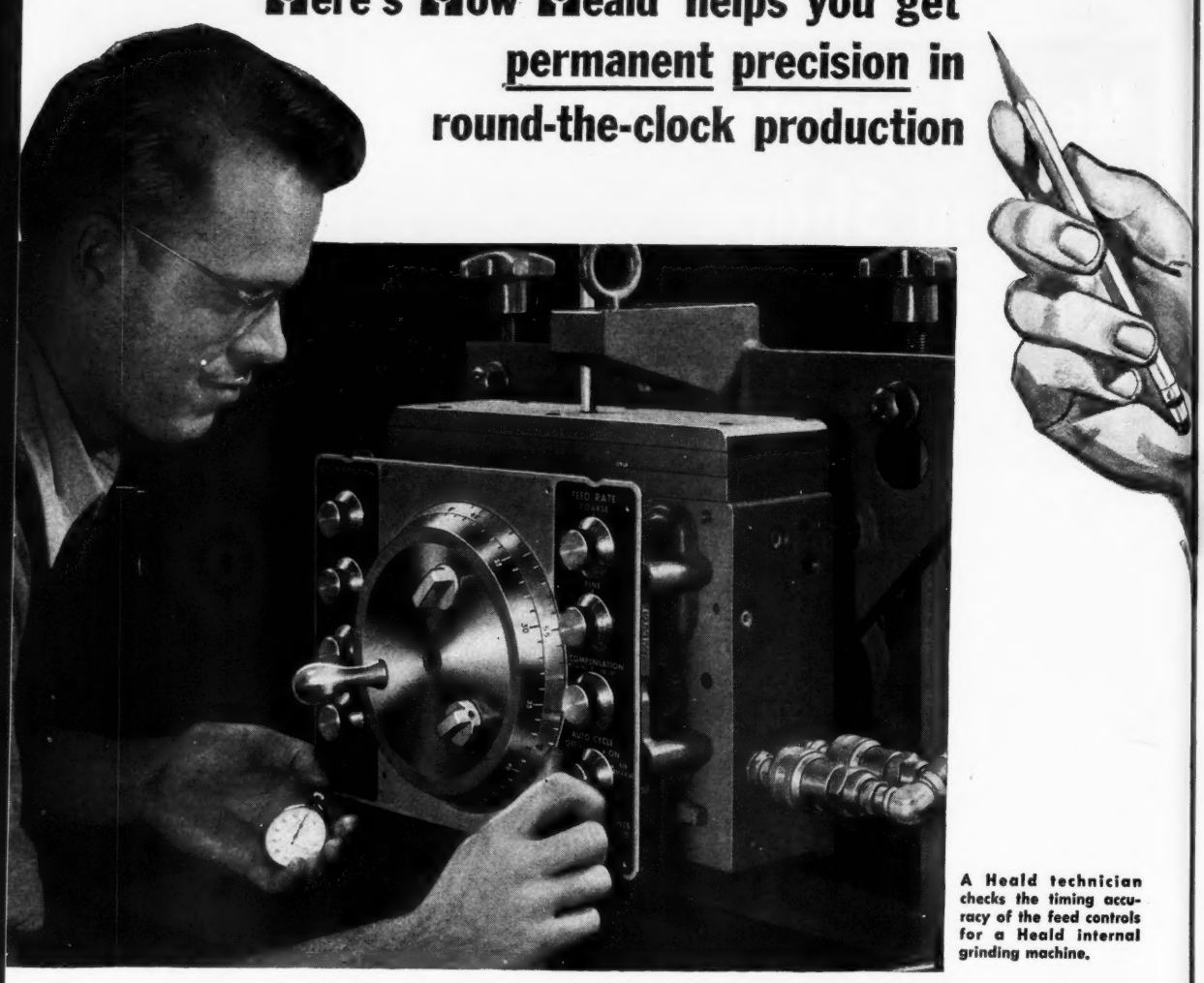
BETHLEHEM PACIFIC COAST STEEL CORPORATION

General Offices: San Francisco

BETHLEHEM PACIFIC

BETHLEHEM STEEL

Here's How Heald helps you get permanent precision in round-the-clock production



A Heald technician checks the timing accuracy of the feed controls for a Heald internal grinding machine.

Constant-feed hydraulic system makes Heald machines independent of changes in temperature and oil viscosity

• Now, when "the heat's on" for sustained high-speed production, you don't have to waste time adjusting feeds and speeds to compensate for changes in temperature and oil viscosity. For these variables are taken care of *automatically* in all new Heald production type internals and Bore-Matics.

A unique system of constant-feed throttling maintains pre-set feed rates throughout the longest production runs — regardless of normal changes in internal or surrounding temperature. Accuracy and precision remain constant — scrap losses are negligible.

That's just one of the many ways in which Heald machines help maintain peak production of precision-finished parts.

HEALD

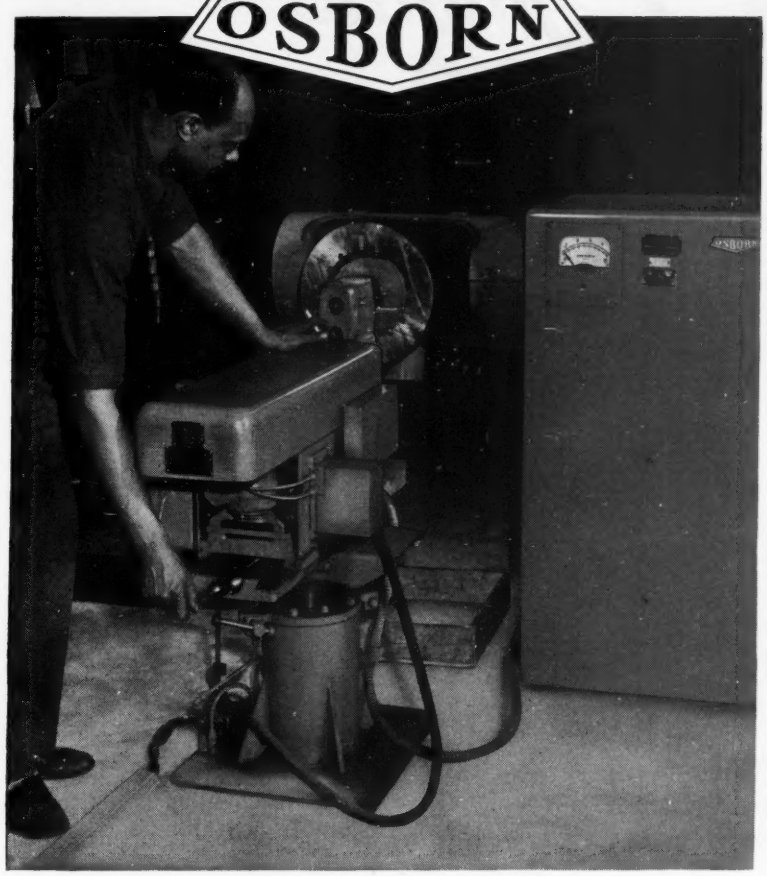
Heald machines speed the nation's production

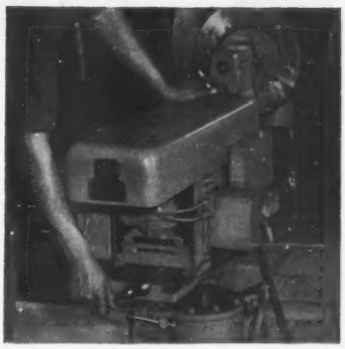
THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

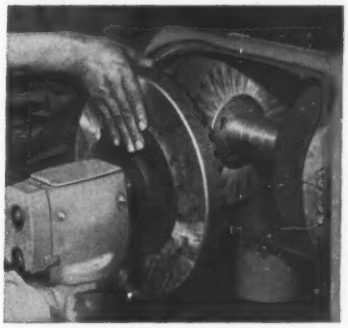
Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

OSBORN





SET-UP IS SIMPLE. The machine is versatile. If your production involves small runs of many different types and sizes of gears and similar parts, you can specify machine settings for each part and operator can make set-up changes easily and quickly for maximum daily output. The complete brushing cycle is controlled automatically by the electronic timer which is set for any desired brushing interval to suit the size, shape or condition of part being brushed.



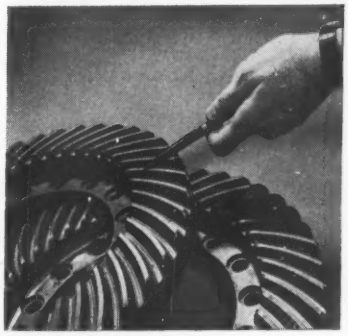
OPERATION IS SPEEDY. The operator mounts the gear easily and quickly. The gear advances to the face of two rotating Osborn brushes and the edge of the gear teeth makes contact with the brushes. To assure fast, positive action on each piece brushed, an automatic control reverses the direction of brush rotation on every cycle of operation.

Deburrs gears 15 times faster at the push of a button!

Want to break a big bottleneck in the production of gears and similar parts? Manufacturers are doing just that with the Osborn Work Holder Brushing Lathe.

In the plant of the White Motor Company, Truck Division, Cleveland, Ohio, this Osborn machine deburrs and finishes gear teeth 1570% faster than the old method. This was done formerly with a portable grinder . . . a tedious operation that took 25 minutes for the 14-inch hypoid gears shown. Now, an operator simply places the gear in the Osborn Work Holder Brushing Lathe, pushes a button and the machine does the job automatically. Floor-to-floor time is only 1½ minutes! Uniformity of finish results in additional time savings in matching and assembly of gears.

It will pay you to investigate this high-speed, high-quality machine for deburring and finishing gears on a production basis. Call your **O**sborn **B**rushing **A**nalyst today or write *The Osborn Manufacturing Company, Dept. 730, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



RESULTS ARE UNIFORM. Burrs and sharp edges are removed uniformly. Every gear tooth has smooth, uniform rounded edges. Surfaces are blended.

INVESTIGATE IT TODAY

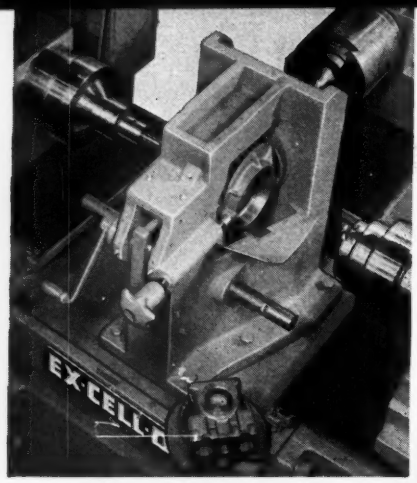
for *your* problems. Users report time savings ranging from 20% to 1570% with the Osborn Work Holder Brushing Lathe. Let us demonstrate what it can do for you!

Osborn Brushes

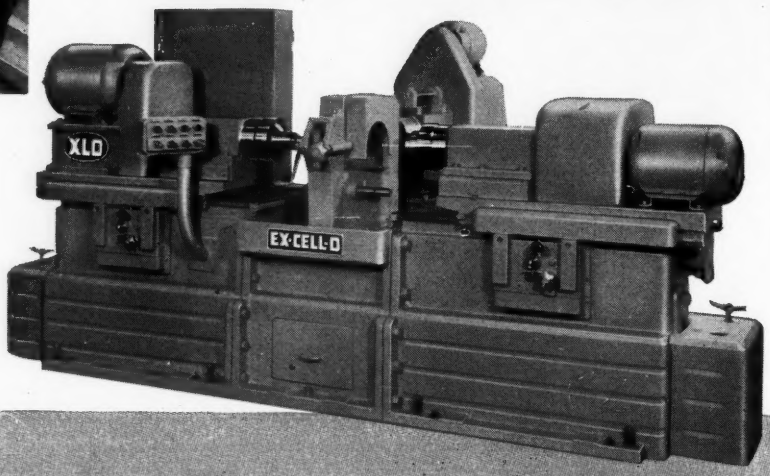
OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

Combine Operations

FOR PRECISION



Close-up view shows relatively simple tooling.



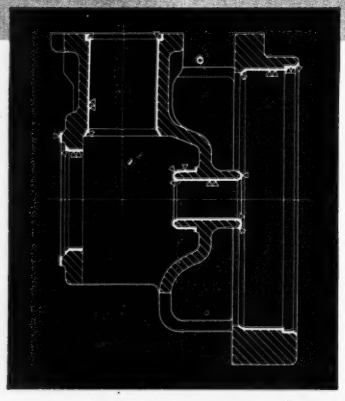
Ex-Cell-O Three-Way Precision Boring Machine.

COMBINING OPERATIONS CUTS COSTS, BOOSTS OUTPUT, PROMOTES ACCURACY

Once a part is properly located and clamped it's good practice to do as much machining on it as possible before it's moved. In this way the various operations can be held in accurate relationship to one another, production is increased, and handling time is minimized.

In machining this cast-iron refrigeration crankcase, five roughing and eighteen finishing operations are held in accurate relationship to one another, with extremely close tolerances on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Sectional view with heavy lines to show operations. Single and double triangles indicate, respectively, single operation and rough-and-finish operations.

XLO
EX-CELL-O for PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS
DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

This Week in Metalworking

STEEL

Vol. 130 No. 22 June 2, 1952

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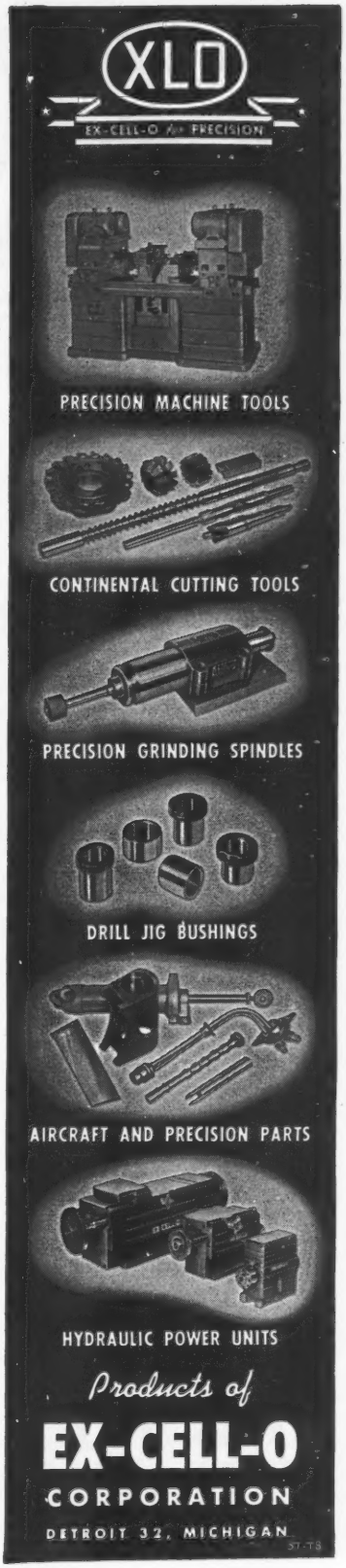


Smoother Finish Longer Tool Life

with

PELRON Cutting Oils

Here's what production men have been looking for—cutting oils that will give smoother and freer removal of metal, with cooler operation and longer tool life.

PELRON CUTTING OILS, developed through extensive research following the newer theories of water soluble cutting oils, have the unique property of breaking loose successive globules of oil at the point of extreme pressure for extra lubrication. Once past the pressure point, or inter-face of the tool, PELRON cutting oils immediately go back into a stable emulsion. This characteristic accounts for the unusually smooth cutting action, the prolonged tool life and all-round improved machine operation.

PELRON CUTTING OILS, are clear, light amber and remain so, giving good visibility at the work point. They form a complete and permanent emulsion with water of any type and hardness.

They settle chips readily in the system, prevent rancidity, odor, or deterioration. In fact, they can be used for months on cast or malleable iron with no rusting, odor, or breaking down of the emulsion.

ISN'T THAT WHAT YOU'VE BEEN LOOKING FOR?

Contact our nearest sales office for a sample and demonstration. Our metal processing experience and engineers are at your service. Let's hear from you.

PELRON
CORPORATION
7740 W. 47TH STREET
LYONS, ILLINOIS

Sales offices: Chicago • Detroit • South Bend
Cleveland • Milwaukee • Indianapolis • Rock Island

Behind the Scenes...

Young America

Our feet are a little sore yet from a long march we just returned from. We led a den of cub scouts through the Penton printing and publishing operation. It was quite an education —for us. We were assured by their lady escort that they were really getting quite a bit out of our talking and their observing the various operations. We weren't quite sure because they seemed to have their attention everywhere but where we thought it should have been.

We're reassured now, though. We were trying to make graphic how much paper was stored in the lower depths of the Penton Building; so we told the little fellows it would perhaps take billions of years to write a sentence like, "I have been a bad boy," on all the paper in the storeroom. We ended the lesson with a flourish, saying: "Now think how quickly that could be done if you could use all the printing machinery and all the presses you've seen.

Piped one little wiseacre: "Ah, I'd just use carbon paper."

Puzzle Corner

As a devotee of "Puzzle Corner," you no doubt have often seen the name of Robert W. Huff as a veteran solver of our problems. Well Veteran Robert is only 17 years old, son of R. W. Huff of Republic Steel Corp. in Massillon, O.

Robert Jr. just won a first prize of $100 in a test given by the American Chemical Society. The competition was open to all senior high school students from three Ohio counties. Robert attends Canton McKinley High. That was the third time the student has won recognition in chemistry. He won an honorable mention in the same contest last year and won an honorable mention in the Westinghouse Talent Search in February.

He, of course, was in again with an explanation of the bank problem of May 19. The sum of the remainders has nothing to do with the sum of the deposits. If the withdrawals, for example, were $5, $10 and $35, the sum of the remainders would be $80. Also having correct answers to that were Ralph Pappenheimer of Specialty Device Co., George W. Frederick of Republic Steel Corp. and L. D. Rice of Timken Roller Bearing Co.

Try this if you're hungry: A chicken weighs 2 pounds plus three-fourths of its weight. What is its weight?

Annual Report

Geraldine, a cleaning woman in the building and our night editor, has been working day and night, to prepare our annual report for 1951. Here's the second annual summary for Shrdlu Inc., incorporated as an unprofitable organization.

Your officer is pleased to report a superb year in 1951. We show a profit of 17 cents, made on sales of reprints. We lost 74 cents in 1949 and 69 cents in 1950, so we are improving.

The outlook for 1952 is fraught with uncertainties. Supply is up but demand is down. Shortages also continue to plague us, but the prospect is for a continued easing in that quarter from now on.

We are going more and more on the defense, and that's helping. Defense spending is supposed to level off or even decline slightly from the middle of the year on, and that will have an adverse effect on our profit performance, but we are still confident.

We are far more favorably situated than many firms in our field because we don't have to worry about renegotiation of our defense profits. We had no defense profits.

Our auditors point out that our cash position is weak, but then it always has been and we've pulled through thus far.

Our markets are extremely tight with little hope of early relief. Car loadings are doing nicely. Boat loadings are firm.

Respectfully submitted,

Shrdlu

President

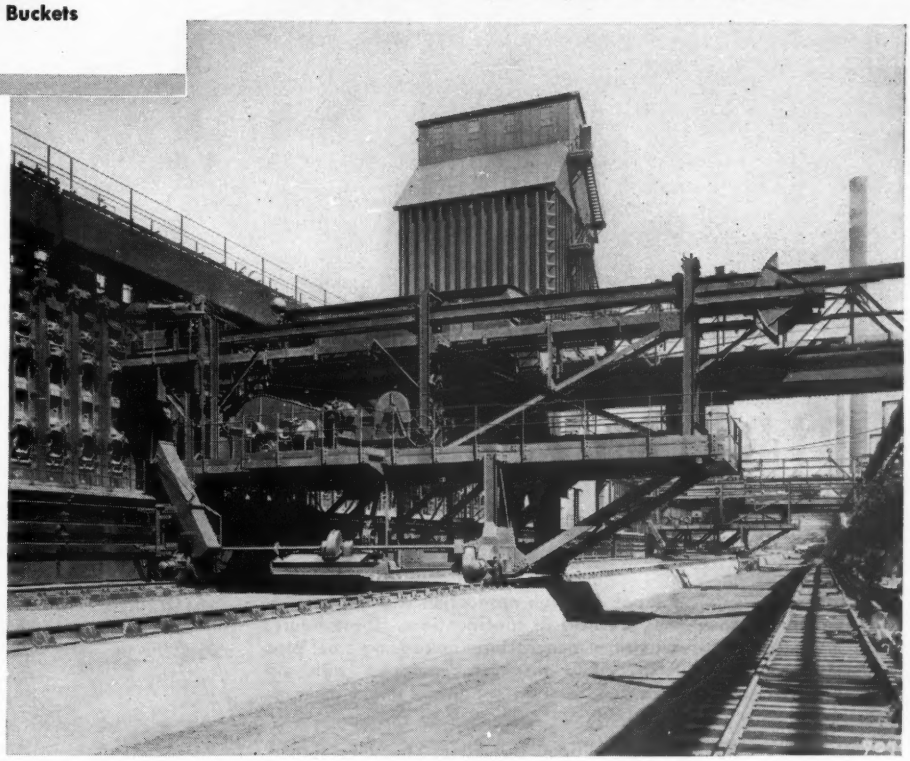
(Metalworking Outlook—Page 55)

Wellman will build it

Special Cranes
Coke Pushers
Gas Producer Plants
Ore Bridges
Charging Machines
Forging Manipulators
Gas Flue Systems
Gas Reversing Valves
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman coke pushers

...engineered for economical, trouble-free performance

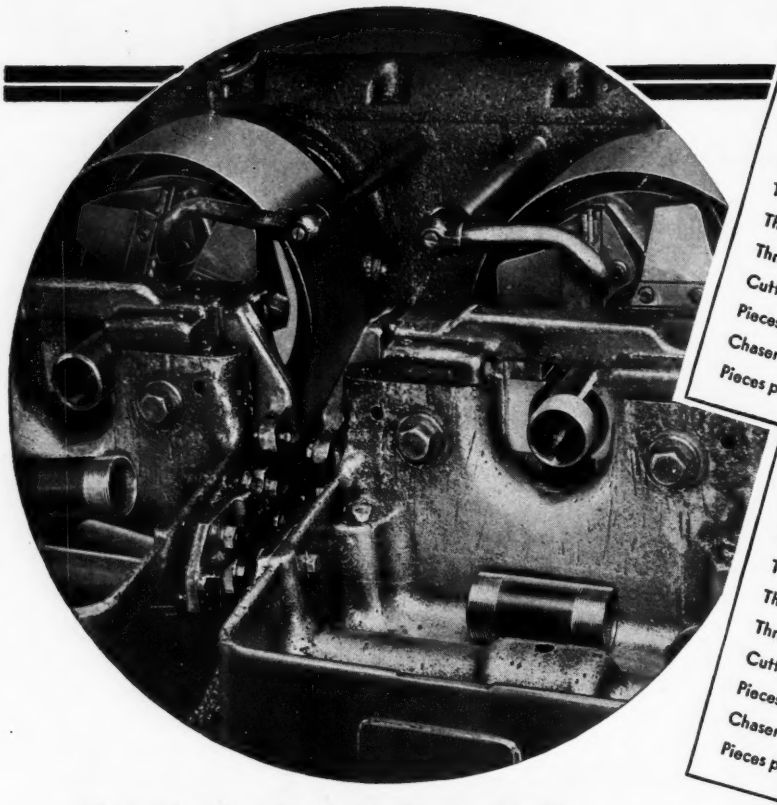


Wellman Combined Coke Pusher, Coal Leveler and Door Extractor in operation at Bethlehem Steel's Lackawanna Plant.

● Many of the world's most modern byproduct coke oven plants are Wellman equipped. The Wellman Engineering Company's more than half-century experience in building heavy machinery guarantees sound design and expert construction. Wellman equipment provides peak economy, maximum safety and trouble-free performance under a wide variety of operating conditions.

THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE • CLEVELAND 4, OHIO



LANDIS MACHINE COMPANY
ENGINEERING DATA
Name of Part 3/4" x 2 1/2" Pipe Nipple
Material Galv Butt Weld Pipe
Thread Pitch 14
Thread Limits ± 1 1/2 Turns
Thread Length 13/16"
Cutting Speed 33 Ft. P.M.
Pieces per Hour 450
Chaser Grind 22° and 88°
Pieces per Chaser Grind 3600

ENGINEERING DATA
Name of Part 3/4" x 10" Pipe Nipple
Material Butt Weld Pipe
Thread Pitch 14
Thread Limits ± 1 1/2 Turns
Thread Length 13/16"
Cutting Speed 38.3 Ft. P.M.
Pieces per Hour 400
Chaser Grind 22° and 88°
Pieces per Chaser Grind 3400

ENGINEERING DATA
Name of Part 2" x 6" Pipe Nipple
Material Butt Weld Pipe
Thread Pitch 11 1/2
Thread Limits ± 1 1/2 Turns
Thread Length 1 1/16"
Cutting Speed 42.8 Ft. P.M.
Pieces per Hour 200
Chaser Grind 22° and 89 3/4°
Pieces per Chaser Grind 1800

ENGINEERING DATA
Name of Part 1 1/2" x 5" Pipe Nipple
Material Butt Weld Pipe
Thread Pitch 11 1/2
Thread Limits ± 1 1/2 Turns
Thread Length 1"
Cutting Speed 35.8 Ft. P.M.
Pieces per Hour 232
Chaser Grind 22° and 89 3/4°
Pieces per Chaser Grind 2000

PIPE NIPPLES...

450 pieces per hour
3600 pieces per chaser grind

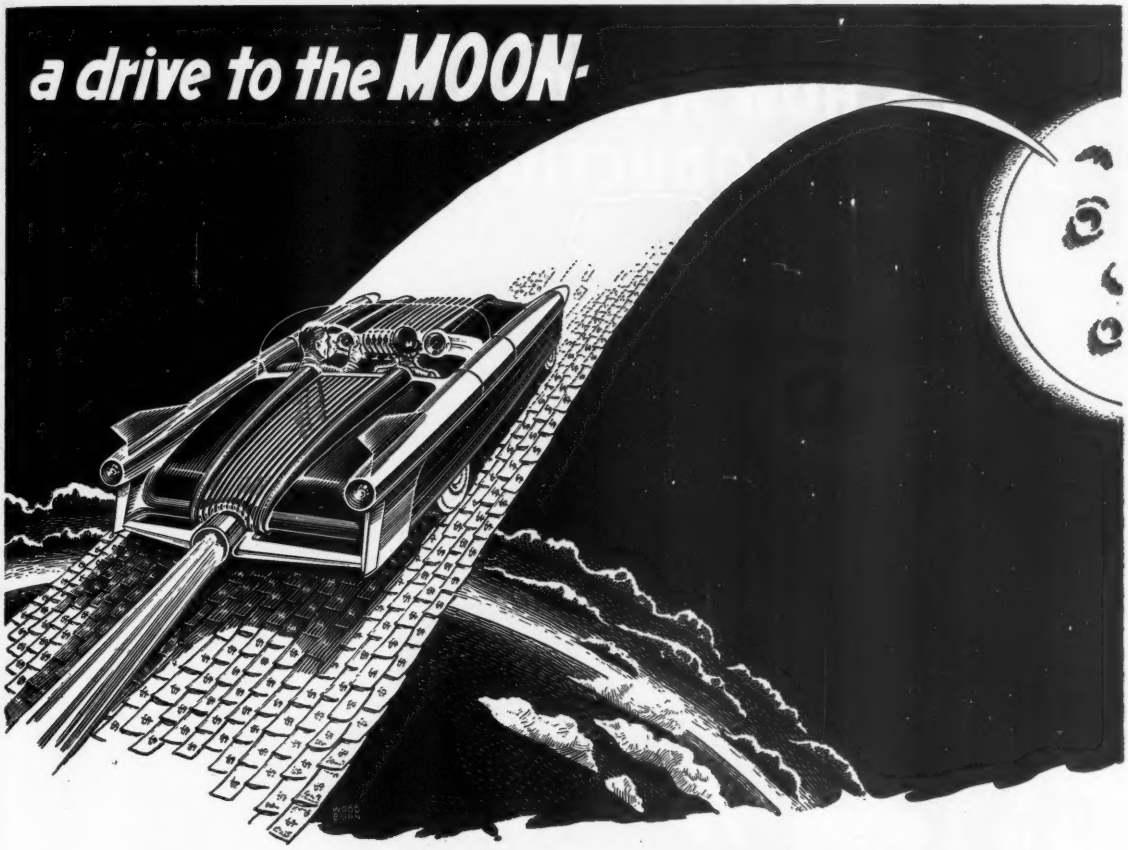
Such production is proof of "high production and low cost"—yet thread tolerances are held to specifications. These figures are production results of a manufacturer producing steel pipe nipples, using LANDMACO machines equipped with air-operated carriage fronts. Different conditions might make an even higher output possible.

LANDMACO Pipe and Nipple Threading Machines thread, ream, and chamfer in one operation. Built in 1¼" and 2" single- and double-head models, these machines are equipped with either internal or external trip heads.

LANDIS Machine COMPANY
WAYNESBORO PA., U.S.A.

WRITE FOR BULLETIN D-84

WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT



On a road paved with YOUR Dollars

A road twenty feet wide, carpeted with one dollar bills, extending 256,471 miles through space to the moon,--illustrates the astronomical magnitude of our Federal debt.

1932 was a bad year for most of us, whether we were in business, or looking for a job, or going to school.

1952 seems much better to the majority of our citizens, with increased business, high wages and a good education for the children.

But how much better off, really, are those of us who think "we're in clover"? Consider our National debt which has skyrocketed from 19 billion dollars to over 260 billion dollars in the past twenty years.

Such a figure is difficult to grasp. But it represents your debt, the amount that you and your family must pay. This debt is the obligation of every man, woman and child in the United States. The interest on this debt must be paid through taxes, and as the debt increases, the more our taxes will increase. If you have a wife and two children, your share of the Federal debt is now approximately $7,000.

Your debt is now 13 times what it was in 1932, and they're planning right now, down in Washington, to inflate it even more.

Do you like it? Is that what you want? If you don't like it and don't want further expansion of our Federal debt, it's up to you to let Washington know. Only when American citizens are aroused and speak up, by electing able and patriotic men to public office, will there be an end to this orgy of public extravagance.

YOUR SCRAP IS NEEDED — YOUNGSTOWN

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

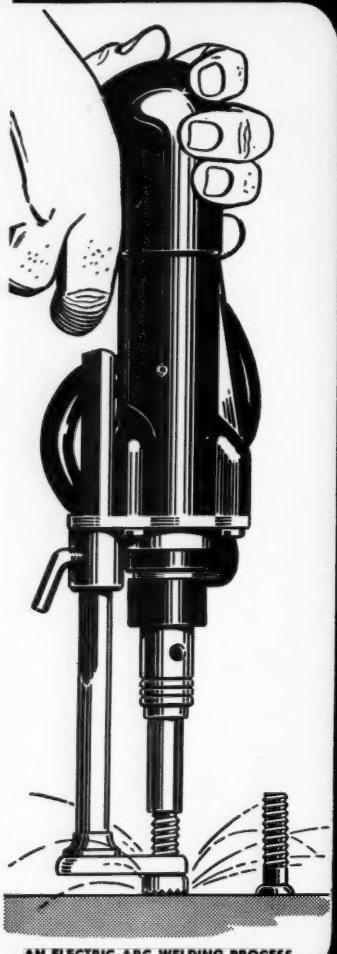
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

IN STEEL FABRICATION...

HERE'S HOW NELWELD SPEEDS PRODUCTION



AN ELECTRIC ARC WELDING PROCESS

END-WELDS STUDS TO STEEL IN A SPLIT-SECOND

ELIMINATES DRILLING, TAPPING, HAND WELDING

REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK

NELWELD

SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES

IMPROVES PRODUCT DESIGN AND QUALITY

A NELWELD CLINIC CAN SHOW YOU—

right in your own plant, how you can benefit from this modern fastening method.

Write today for the Nelweld Clinic brochure to Lorain, Ohio.

Fasten it Better...at Less Cost, with NELWELD

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

STEEL

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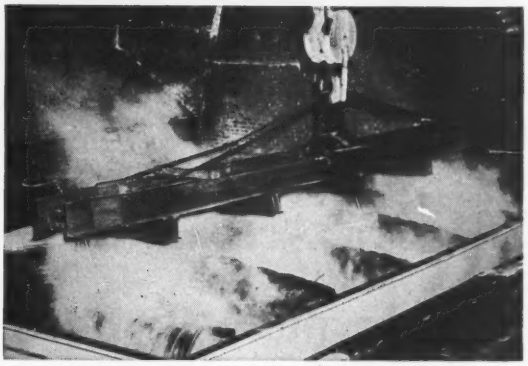
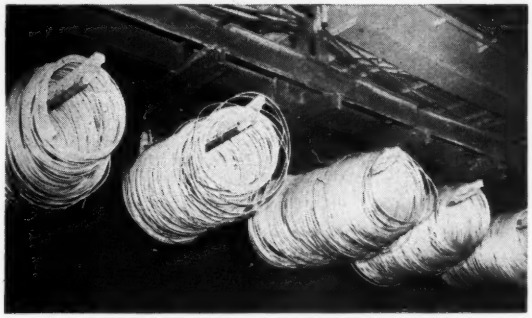
Descaling 5 tons of stainless wire *IN 15 MINUTES* with VIRGO® Descaling Salt

10-MINUTE IMMERSION in molten bath of Virgo Descaling Salt at 900°F. loosens scale. The bath is self-regenerating, and produces no toxic fumes. Immersion time and temperature are flexible, need not be watched closely.



WATER QUENCH removes much of the loose scale. The steam generated by immersing the hot metal in the water further loosens scale by its blasting action. The work is thus prepared for the final acid dip.



THREE-MINUTE DIP in dilute acid removes the now soluble scale. The work is ready for a rinse or hosing to wash off the acid. Result: a chemically clean surface—no pitting, etching or metal loss. TOTAL TIME—15 MINUTES.

VIRGO DESCALING SALT—Producers and fabricators of stainless and alloy steels use Virgo Descaling Salt to quickly, positively remove scale produced by hot rolling, forging, extruding, casting, annealing.

VIRGO MOLTEN CLEANER—quickly, positively desands and degraphitizes castings; removes grease, dirt, chemicals, paint, enamel, rubber, atmospheric corrosion and other impurities.

This process can be used on steel; castings; forgings; fabricated parts; material to be salvaged. It employs simple equipment, and is easily adapted to your production methods.

SEND FOR THESE BULLETINS—Get the whole story on Virgo Descaling Salt and Virgo Molten Cleaner—what they are, how they work, their advantages, how they fit your operations, and the Hooker services you enjoy as a user of the process. Send for these bulletins today.

Hooker Electrochemical Company
19 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

Please send me Bulletins checked: Virgo Descaling Salt ☐ Virgo Molten Cleaner ☐

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COMPANY_____

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HOOKER CHEMICALS®

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY
19 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.
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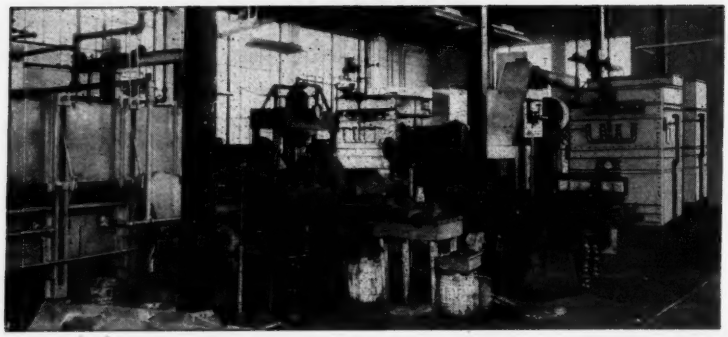


Niagara Aero Heat Exchanger quickly pulls down the initial peak load of heat in quenching . . . and saves cooling water

Accurate control of quench bath temperatures and quickly effective capacity to handle the initial peak load of heat in quenching prevents production set-backs, increases the output of your heat treating department, prevents oil fires, saves you losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Write for Bulletin #120 giving complete information.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. **New York 17, N. Y.**

Experienced District Engineers in all Principal Cities of U. S. and Canada

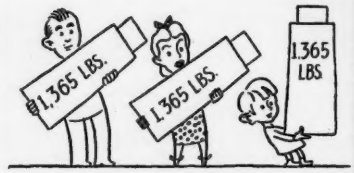
LETTERS

TO THE EDITORS

Stimulating Statistic

We are interested in obtaining the 1951 figure showing the amount of steel used for each family or person in the United States.

S. K. Oliver
A. M. Castle & Co.
Los Angeles



• *Latest figures of the American Iron & Steel Institute report production of raw steel in the continental U. S. for 1951 was about 1365 pounds for each person, an increase of 86 pounds over the previous year, and higher than ever before.*

An Error in Tolerances

We read in your article "Better Than Watchmakers" (Mar. 31, p. 78) that the fabrication of the jet engine fuel nozzle requires finishing to a tolerance of 1/10,000-inch, and that this is "ten times watchmakers' precision."

No self-respecting watchmaker could let this statement go unchallanged. Tolerances of 1/10,000-inch are commonplace in this industry and we have several manufacturing operations involving tolerances far closer than that.

J. W. LaBine
Elgin, Ill.
Elgin National Watch Co.

• *We apologize to all watchmakers.*

Spotlight on Spot Welds

The article "Spot Weld Monitering" (Apr. 21, p. 79) describes a nondestructive test for checking the quality of spot welds. A device such as you describe would be very helpful to us on a new spot welding application which we have. We would appreciate it very much if you could give us the name of the manufacturer.

R. H. Lincoln
National Pressure Cooker Co.
Eau Claire, Wis.

. . . please put us in touch with the manufacturer.

W. L. Spangler, sales manager
B-W Manufacturers Inc.
Kokomo, Ind.

• *Write to S. S. Barnhart and W. B. Hills, General Electric Co., Schenectady, N. Y.*

Who Made How Much Money

We have mislaid the annual financial report covering the year 1950. Can you send us a copy of that report? Also, will you advise whether we have missed the 1951 figures.

R. M. Warfel
Tubular Service Corp.
Springdale, Pa.

• *On their way to Mr. Warfel are the "Financial Analysis of the Steel Industry" which appeared in the Apr. 30, 1951 issue and the Apr. 21, 1951 issue of* STEEL.

Nothing nicer under the sun —

When the sun's agleam and the cool breezes blow, who wants to sit inside? That's the time to collect a few friends . . . a few steaks or burgers and buns . . . and dine in the great outdoors!

Why don't *you* do it? Your own yard—big or small—would make a delightful outdoor living area. All you need spend is a little energy, a little imagination, and a little money for furnishings.

There is a wide variety of steel outdoor furnishings to choose from—all reasonable in price. They're smart, colorful, modern. They resist corrosion, rot, fire and warping better than any other paintable furniture. That means the pleasure they give is yours for years, no matter what the weather.

In any product, steel means longer life, greater satisfaction. Make steel your standard—and save.

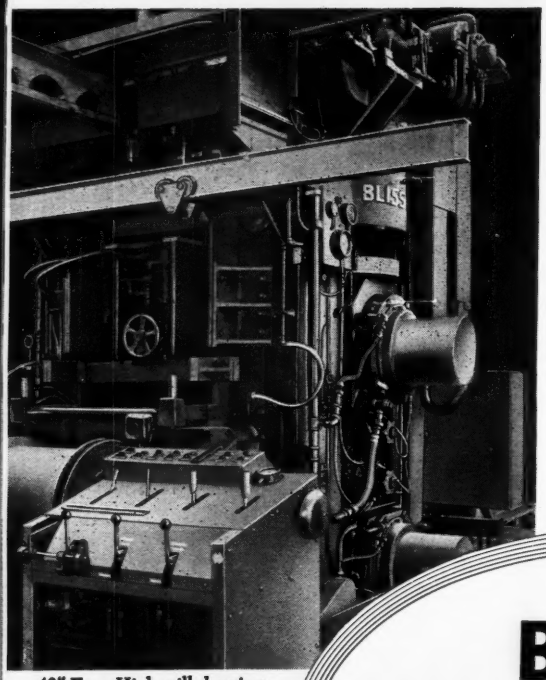
Metal sculpture, executed in Weirzin electrolytic zinc-coated steel, demonstrates the exceptional workability of this easily fabricated metal.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY, WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Bliss Rolling Mills Meet the Test of Severe Usage at Alcoa



42" Four-High mill showing cone type payoff.

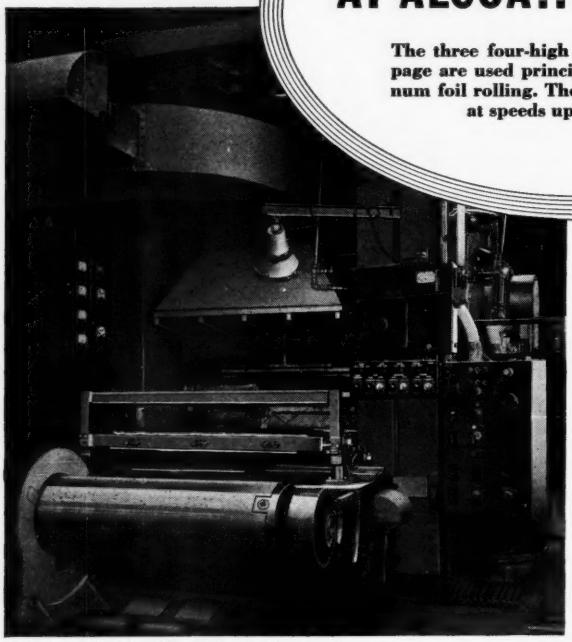
Whether it's strip, sheet or foil, hot or cold working, you will find Bliss Rolling Mills and Accessories meeting exacting standards throughout the various plants of the Aluminum Company of America. Illustrations of various four-high mills installed in Alcoa plants at Edgewater, New Jersey and Davenport, Iowa are shown on these pages.

With non-ferrous and ferrous metal producers alike, Bliss Rolling Mill engineers concentrate on the design of equipment, combining the speeds and controls required with the rigidity and accessibility necessary for long trouble-free service.

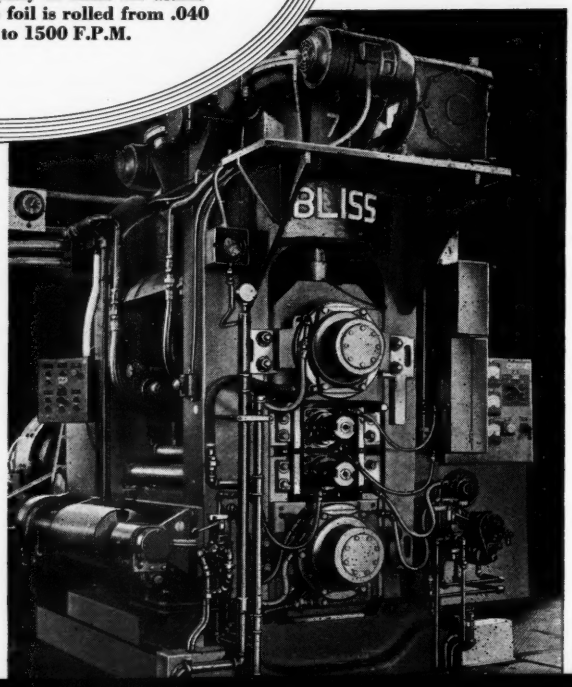
For the engineered refinements that make for maximum production—for the rugged rolling mill performance you want, put your problem up to Bliss. You'll get the same keen counsel that's made Bliss the first name in presses for more than 90 years.

BLISS
AT ALCOA...EDGEWATER

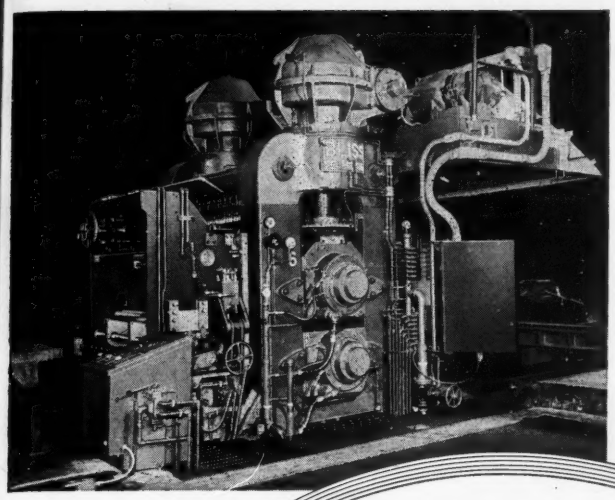
The three four-high mills illustrated on this page are used principally as mills for aluminum foil rolling. The foil is rolled from .040 at speeds up to 1500 F.P.M.



60" Four-High mill with tension reel, stripper, coil buggy and outboard bearing.

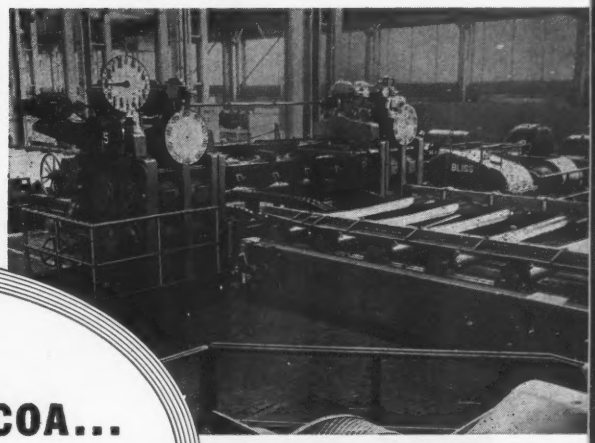


34" Four-High mill, one of four installed.



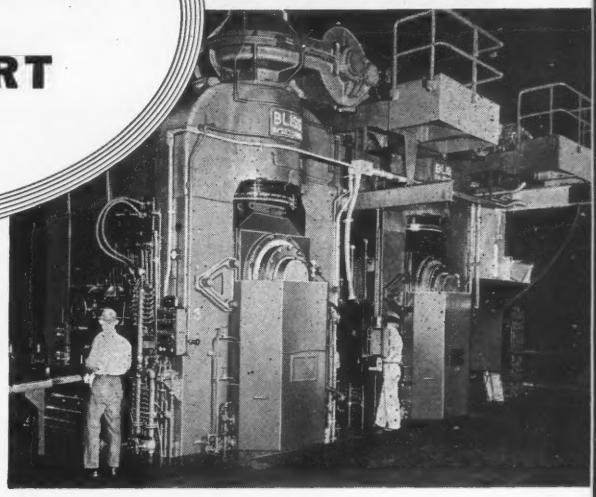
60" Single-Stand Two-High mill at Davenport, used extensively for rolling specialty sheets and temper pass rolling on the lighter gages. A Bliss 48" Single-Stand Two-High mill is also installed at Davenport.

Bliss side trimmer and scrap chopper in Davenport's hot mill line capable of trimming stock up to 1" thick by 136" wide.

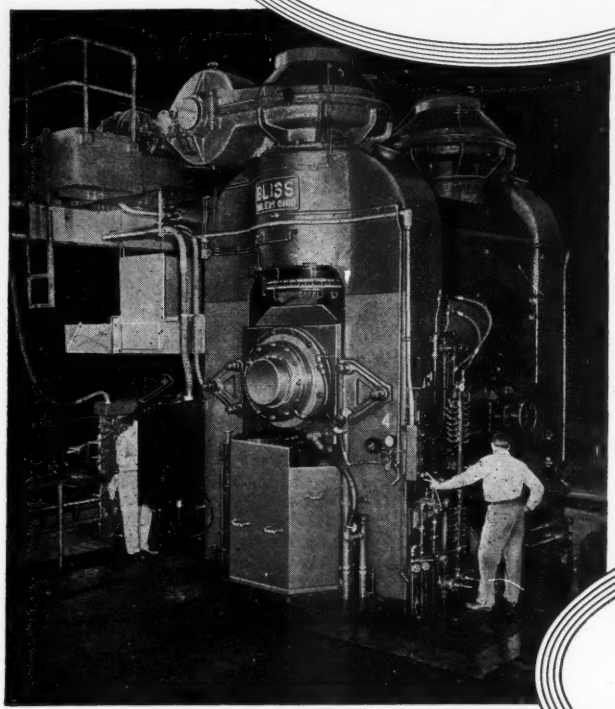


BLISS AT ALCOA...

DAVENPORT



72" Two-Stand Four-High mill at Davenport, used to roll a hard-alloy aluminum. Reductions generally run from .144 to .065.



72" Single-Stand Four-High mill at Davenport, a general-purpose reduction mill. Reductions have been as much as 60%, although 50% is considered average.

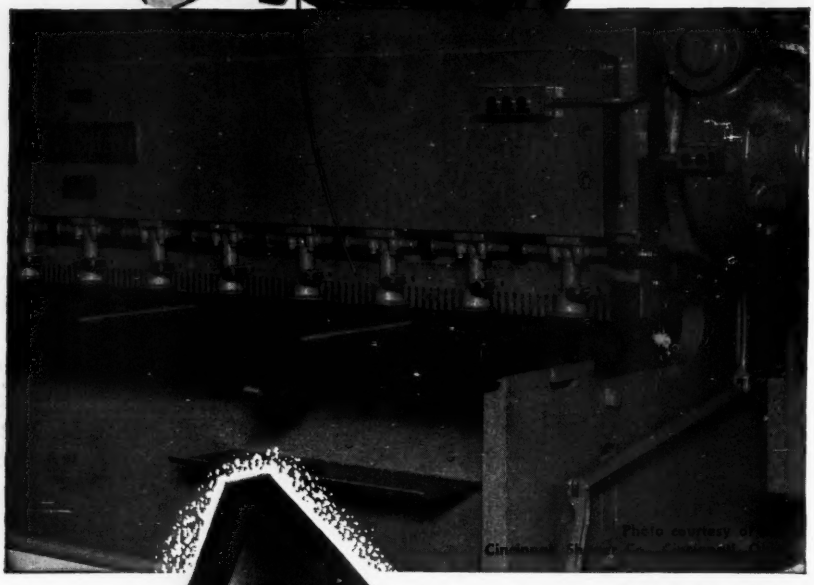
E. W. Bliss Company

General Office: Canton, Ohio

Rolling Mill Division, Salem, Ohio

Presses, Rolling Mills, Special Machinery

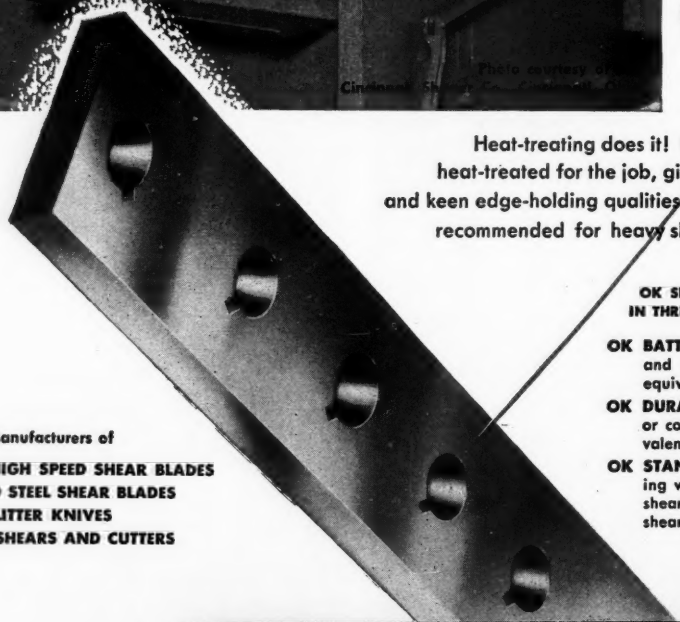
it's... OK let 'er go!



cut costs on your toughest jobs with OK SHEAR BLADES

Keep production costs down. Keep your machines running. OK Shear Blades run longer between regrindings . . .

Heat-treating does it! OK Shear Blades are specially heat-treated for the job, giving them maximum toughness and keen edge-holding qualities. OK Shear Blades are highly recommended for heavy shearing and heavy plate work.



OK SHEAR BLADES ARE MADE IN THREE OUTSTANDING GRADES:

OK BATTLE AXE For shearing up to and including ¼" mild steel or equivalent.

OK DURA-CHROME For shearing hot or cold plate up to 1¼" or equivalent.

OK STANDARD For any type of shearing where only short runs or little shearing is done, and heavy plate shearing.

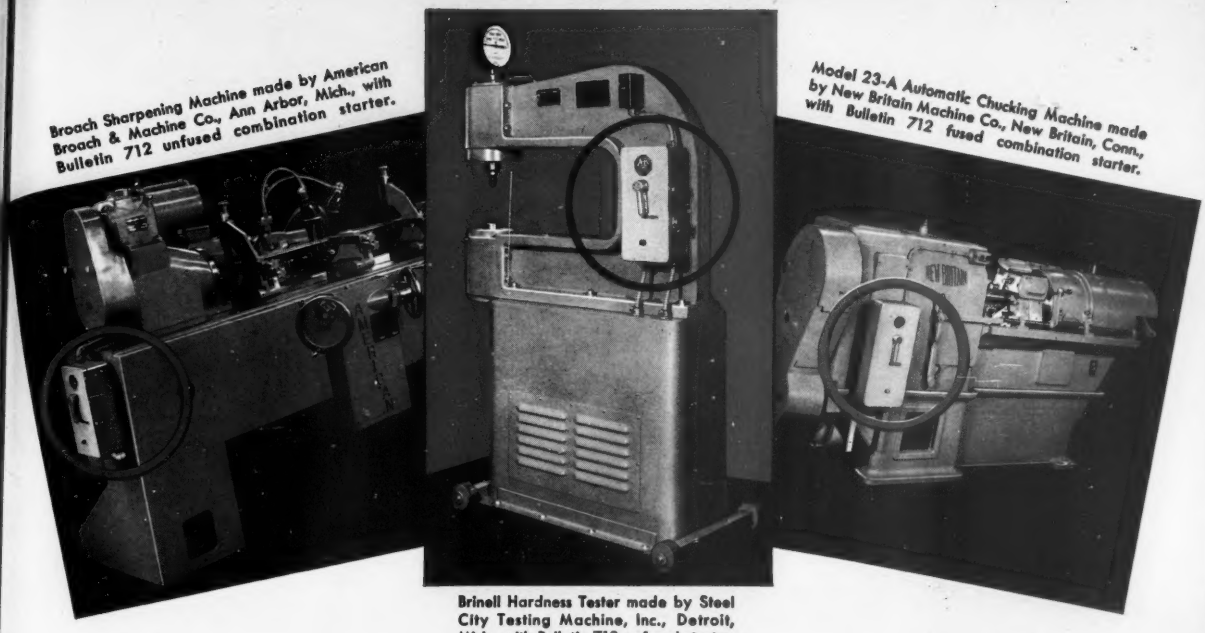
Manufacturers of

OK WELDED HIGH SPEED SHEAR BLADES
OK SOLID STEEL SHEAR BLADES
SLITTER KNIVES
ROTARY SHEARS AND CUTTERS

GO WITH OHIO GREEN

THE OHIO KNIFE CO.

CINCINNATI 23, OHIO



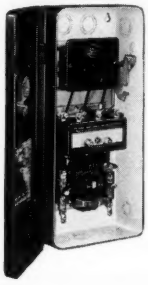
Broach Sharpening Machine made by American Broach & Machine Co., Ann Arbor, Mich., with Bulletin 712 unfused combination starter.

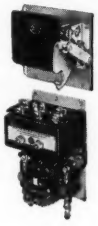
Model 23-A Automatic Chucking Machine made by New Britain Machine Co., New Britain, Conn., with Bulletin 712 fused combination starter.

Brinell Hardness Tester made by Steel City Testing Machine, Inc., Detroit, Mich., with Bulletin 712 unfused starter.

SIMPLIFY YOUR CONTROL INSTALLATIONS

by using A-B Combination Starters





BULLETIN 712 COMBINATION STARTER

The above illustrations show how the Allen-Bradley combination starter with manual disconnect unit is arranged either for open or enclosed mounting.

An important feature is the mechanical interlock between the operating lever on the outside of the cabinet and the disconnect unit. The cabinet cannot be opened until the disconnect lever has been moved to open the disconnect switch. The magnetic switch is "dead" when the door is open . . . a valuable safety feature.

A great many machine tools need merely an automatic across-the-line starter and a disconnect switch. For such machines the ideal control unit is an Allen-Bradley combination starter . . . with starter and disconnect in one compact cabinet. Installation cost is less, too.

Look at the above well-known machines. See how neat and compact is the control unit . . . just one Bulletin 712 combination starter.

These A-B combination starters provide reliable overload protection for the motor. An overloaded motor is disconnected automatically and cannot be started until the overload is cleared.

Bulletin 712 combination starters have a manual disconnect switch, fused or unfused. Bulletin 713 starters have an instantaneous circuit breaker. For wet, dusty, or hazardous locations there is a complete line of safety enclosures that protect starter and safety switch or circuit breaker from water, dust, and explosive fumes. Let us send you Bulletin 712-713.

3-52-R

Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

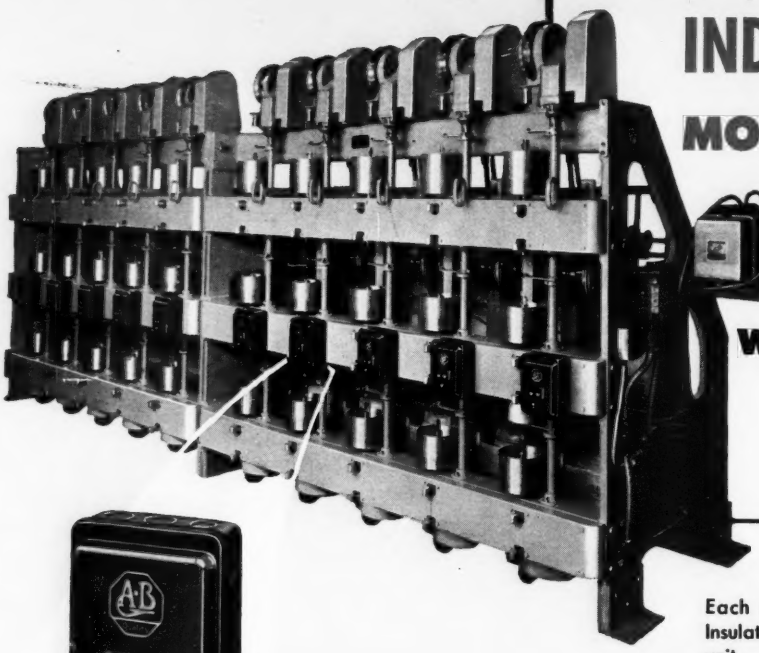
A-B

ALLEN-BRADLEY

COMBINATION STARTERS

QUALITY

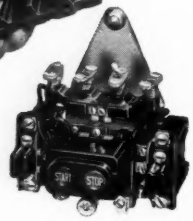
INDIVIDUALIZED
MOTOR STARTERS
for this
10-SPINDLE WIRE INSULATING MACHINE



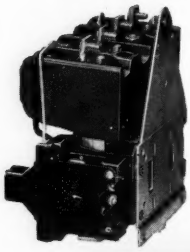
BULLETIN 709 FORM 1 STARTER has start and stop push buttons in cover. Saves space, eliminates conduit and wiring, and makes a neater wiring installation.

CLOSE-UP OF PUSH BUTTON. Start and stop push buttons are a self-contained unit mounted in a small bakelite housing.

NO CONTACT MAINTENANCE. Allen-Bradley double break, silver alloy contacts are good for long maintenance free operation. Never clean, file, or dress them.



DEPENDABLE OVERLOAD RELAYS. A-B thermal overload relays trip automatically and disconnect an overloaded motor. They prevent motor burnouts.

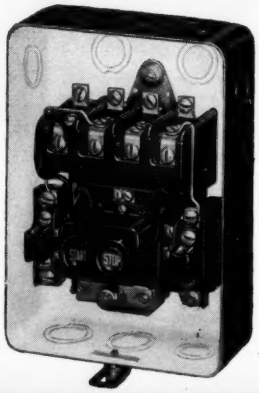


Each spindle of this 10-spindle American Insulating Machine is a separate operating unit . . . with its own motor drive and its own control. By using ten Allen-Bradley Bulletin 709 Form 1 starters . . . with push buttons in the cover . . . flexible and convenient control is obtained at minimum cost for all spindles.

Since there are no external push buttons, no auxiliary control wiring is needed, which results in a greatly simplified and neater conduit and wiring installation.

Two overload relays in each starter are perpetual watchdogs, which will instantly stop the motor, automatically, if an overload occurs.

As for control maintenance, there is none when you install Allen-Bradley solenoid starters with silver alloy contacts. For more details, please write for Bulletin 709.



EASY TO INSTALL. Bulletin 709 starters have bonderized cabinets with white interiors that make installation easy in dark corners. Plenty of knockouts, too.

Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

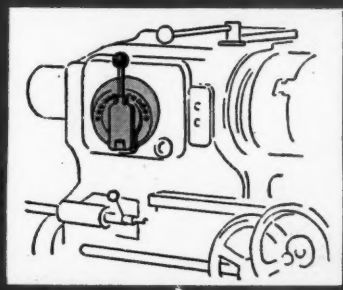
A-B

ALLEN-BRADLEY
SOLENOID STARTERS
QUALITY

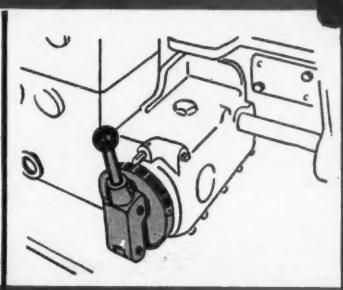
3-52-R

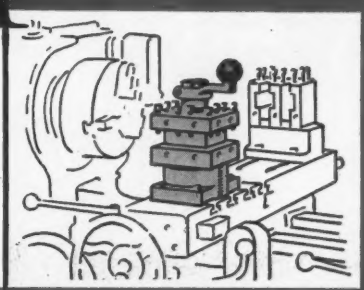
another reason why J&L turret lathes produce

MORE CHIPS PER TOOL
MORE PIECES PER HOUR
MORE PROFIT PER JOB

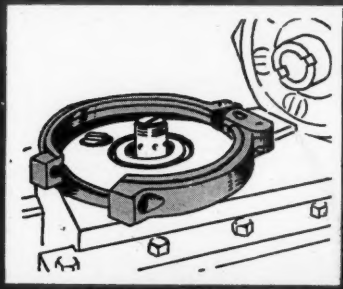


Single lever speed and feed selectors—preselector type.

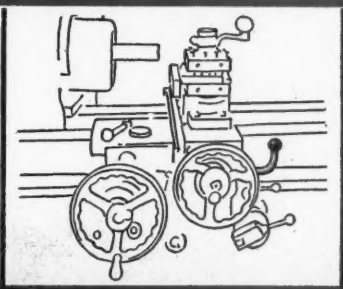




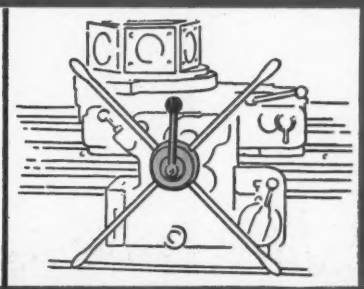
Quick indexing—self-locking—square turret.



Automatic clamping of hexagon turret.



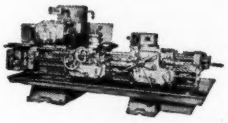
Power rapid traverse for cross slide.



Two-speed power traverse of saddle and power indexing of hexagon turret on all saddle type machines.

MORE EASE OF OPERATION!

J & L Turret Lathes are the easiest to operate, because controls are fewer, simpler and easier to reach. The operator can select the speed and feed for the *next* cut while machine is operating. Power rapid traverse for the cross slide, two-speed power traverse for the saddle and power indexing of the hexagon turret, also help take the strain off the operator and increase your production.



P.S. ***Power bar feeds and chucks, and power torque chuck wrenches are also available. Write to Dept. 710 for Catalog.***

"World's most accurate and powerful turret lathes"

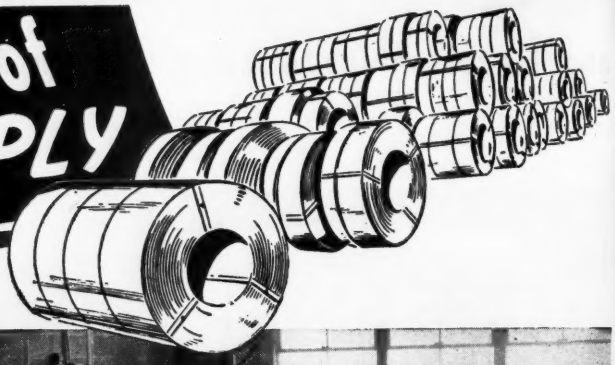
RAM TYPES: Bar, 1½" to 4½", Chuck, 10" to 12". SADDLE TYPES: Bar, 2½" to 5", Chuck, 12" to 18".

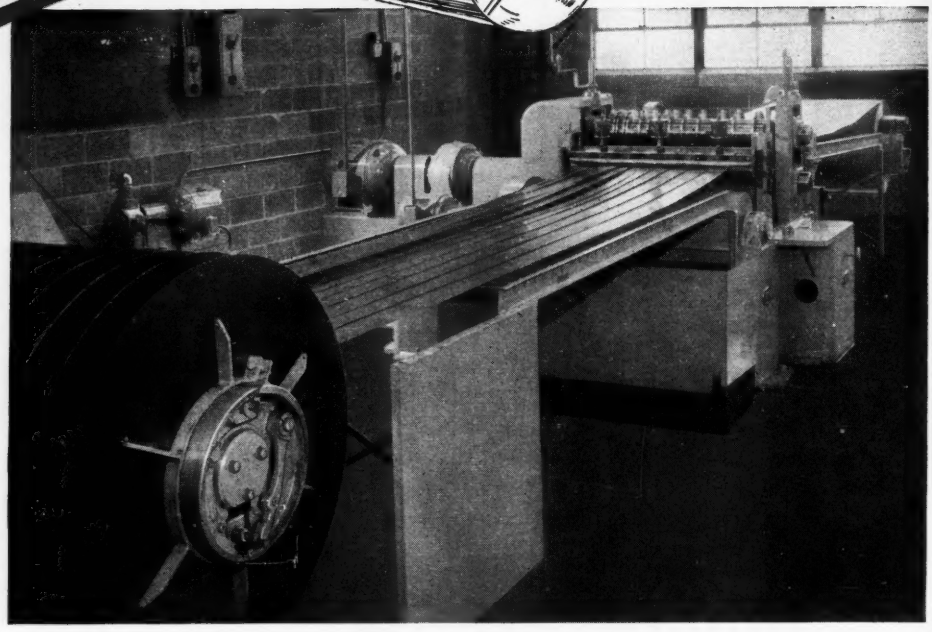
JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. J&L TURRET LATHE DIV.

Better Control of STRIP SUPPLY





● If you use over 100 tons of strip per month, in special widths, a Yoder Slitter will bring welcome relief from strip supply difficulties.

Mill-width strip is more easily obtained, from numerous sources, and at lower cost. A saving of ten to twenty dollars per ton is quite common, soon paying for the slitter investment.

With a flexible stock of mill-widths of the desired gauges, you no longer need to anticipate requirements for special widths far in advance. Your production planning becomes much easier and the need for big inventories of slit strands disappear when you can supply your own needs on a few hours' notice.

Send for literature on the economics and mechanics of slitter operation. Consultations, estimates, recommendations for the asking.

THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio

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- ★ GANG SLITTING LINES for Coils and Sheets
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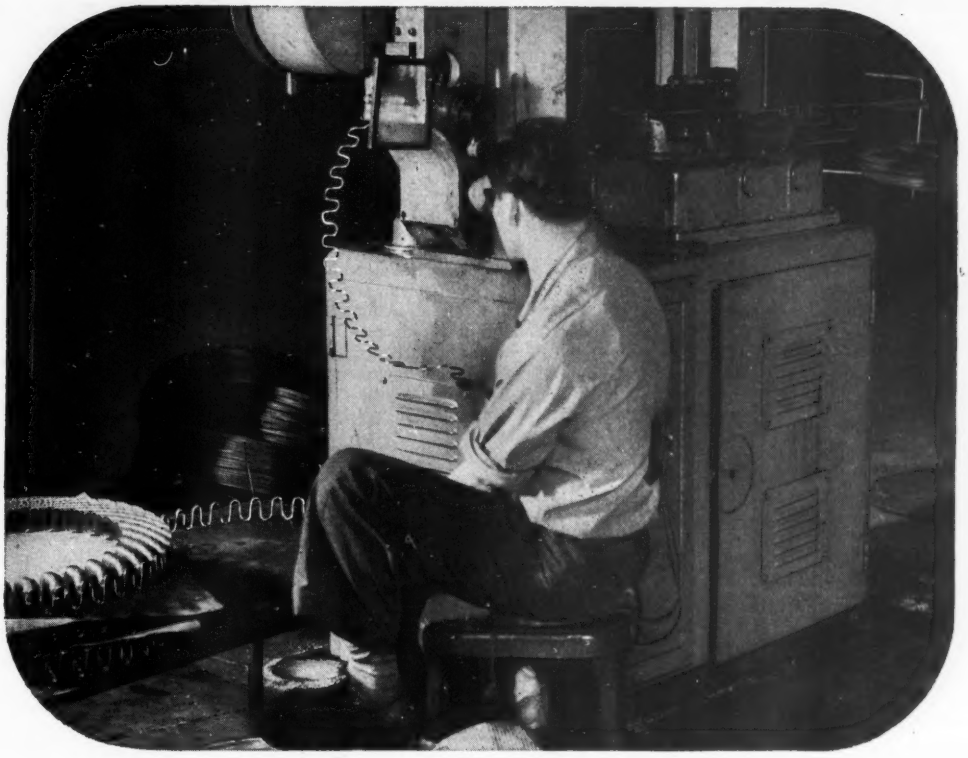
SPRING WIRE



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ROEBLING is about the largest specialty wire manufacturer in America. And with progressively improved facilities and more positive controls we are constantly turning out wires with a higher uniformity of gauge, finish and mechanical properties.

Among these products that save preparation time and boost production for users are mechanical spring wires including hard drawn, soft, annealed or oil-tempered M.B., H.B. and Extra H.B.; music wire; upholsterers' spring wire and valve spring wire... all in a full range of physical properties and finishes.

Large quantities of Roebling specialty wire are required in the defense program. We will always do our best, however, to meet your delivery needs. John A. Roebling's Sons Company, Trenton 2, N. J.

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ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

How NITROGEN Refines Grain Size...

Produces Harder, Stronger, Tougher Chromium Steels

When nitrogen is added to high-chromium steel, it greatly refines the grain size of the metal and materially increases its strength, toughness, hardness, and wear resistance—without sacrificing ductility or reducing corrosion resistance. For these reasons, nitrogen-bearing chromium steels are well suited for cutlery, turbine blades, and various machinery parts that are subject to extreme wear.

Added to Steel In Ferrochrome

Nitrogen is usually added to chromium steels in the form of nitrogen-bearing ferrochrome containing 0.75 per cent and up of nitrogen, 70 per cent chromium, and a maximum of 0.10 per cent carbon. Depending upon the chromium content of the steel, which can range between 12 and 30 per cent, the nitrogen content may vary between 0.06 and 0.20 per cent. The amount of nitrogen added to high-chromium steels should be 1 part of nitrogen to between 100 and 200 parts of chromium, depending upon the chromium content of the steel.

Nitrogen-bearing ferrochrome is added to the furnace in the same manner as ordinary ferrochrome. Nitrogen recovery will average about 90 per cent.

Improves Cutlery Steel

Cutlery steels and other martensitic stainless steels, such as the 12 to 14 per cent chromium low-carbon steels that are used for turbine blades, are hardenable by heat-treatment. Hardenability and strength increase with the carbon content. And, since nitrogen is a more powerful austenite-former than carbon, it is sometimes used as a substitute for part of the carbon, or as a supplement to the carbon, to increase the strength and hardenability of these steels.

Nitrogen has distinct advantages over carbon for this purpose because ductility, toughness, and corrosion resistance are retained when nitrogen is added to steel. It increases the hardness of cutlery steels without detrimentally affecting toughness or corrosion resistance. The effect of small additions of nitrogen in increasing the hardness of cutlery steels is shown in the table below.

Reduces Grain Growth During Hot-Working

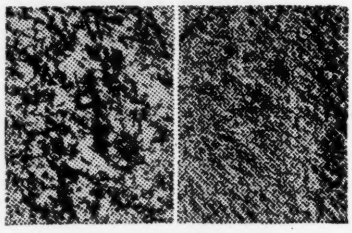
The ferritic high-chromium stainless steels to which nitrogen is added have a finer grain size than ferritic steels without nitrogen, which are comparatively coarse-grained. These include the 16 to 18 per cent chromium wrought steels, high-chromium steels containing small percentages of nickel, and both the cast and wrought 20 to 30 per cent chromium steels. The function of nitrogen when added to the ferritic high-chromium steels is to preserve a fine grain size.

The nitrogen-bearing, high-chromium wrought steels are more readily rolled and forged than comparable steels containing no nitrogen, because grain growth is inhibited during hot-working operations. Greater yields are therefore obtained in rolling and fabricating. Also, strength and toughness are increased as a result of the grain refinement caused by the nitrogen addition.

Effect of Nitrogen on the Hardness of Cutlery Steels*

% Cr.	% C	% Si	% Mn	% Mo	% N	Rockwell C Hardness	Brinell Hardness Numbers (by conversion)
13.15	0.12	0.30	0.38	...	0.03	41	387
13.25	0.13	0.29	0.42	...	0.10	48	460
13.36	0.23	0.28	0.40	...	0.03	46	437
13.27	0.21	0.34	0.32	...	0.08	51	496
12.70	0.32	0.30	0.37	...	0.04	50	484
13.41	0.35	0.31	0.41	...	0.11	56	560
17.37	0.41	0.32	0.41	0.75	0.036	41	382
17.25	0.44	0.30	0.42	0.75	0.09	53	522
17.30	0.66	0.29	0.38	...	0.03	51	496
17.08	0.60	0.31	0.40	...	0.11	55	547
17.26	0.80	0.28	0.39	0.76	0.032	52	509
17.25	0.80	0.27	0.45	0.74	0.09	57	573

*Steels oil-quenched from 950°C. Held 5 hr. at 200°C. and air-cooled.



Note the extent to which nitrogen refines the grain size of those specimens containing about 27 per cent chromium and 0.35 per cent carbon. The specimen at the left contains 0.05 per cent nitrogen; the one at the right, 0.30 per cent nitrogen.

Greater Strength for Austenitic Steels

Small percentages of nitrogen will increase the yield point and tensile strength of the austenitic chromium-nickel steels. These include the well-known 18 per cent chromium, 8 per cent nickel steels, and also the 25 per cent chromium, 12 per cent nickel steels. The improvement in strength is gained at practically no sacrifice of workability. Furthermore, nitrogen promotes the formation of austenite.

Metallurgical Service Available

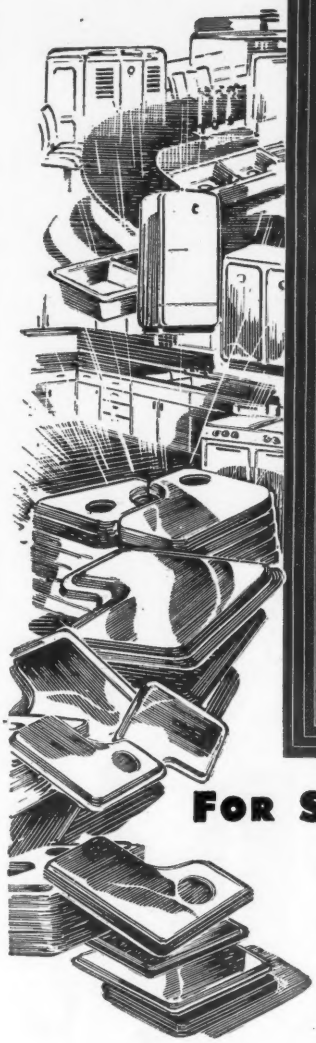
ELECTROMET nitrogen-bearing ferrochrome is furnished in the following standard analysis:

Chromium.....67 to 71%
Carbon.....0.10% max.
Silicon.....0.30 to 1.00%
Nitrogen.....0.75% approx., or higher if desired.

It is produced in lump sizes of 25 lb. by 8 mesh, or 15 lb. by 8 mesh; also, in a crushed size of 2 in. by down.

If you would like additional information about the production of nitrogen-bearing steels, ask to have one of our metallurgists call, or ask for the booklet, "Nitrogen In Chromium Alloy Steels." Write to the address given above or to the ELECTROMET office nearest to you. Offices are in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York and San Francisco. In Canada: Welland, Ontario.

The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.



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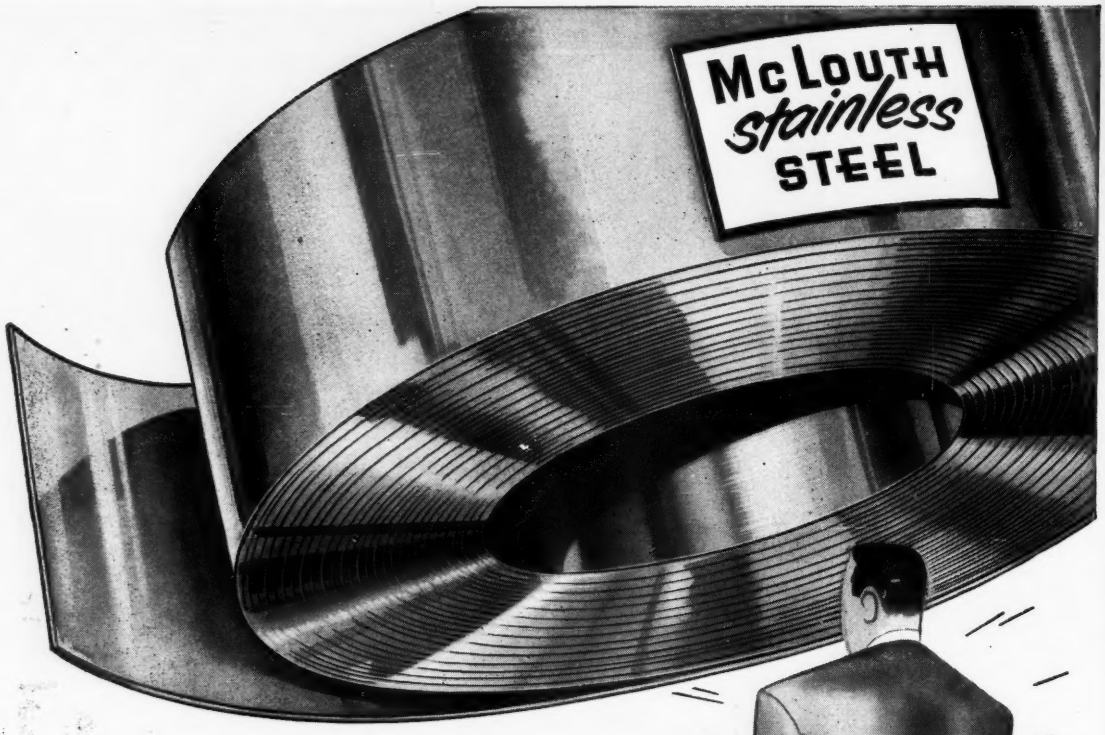

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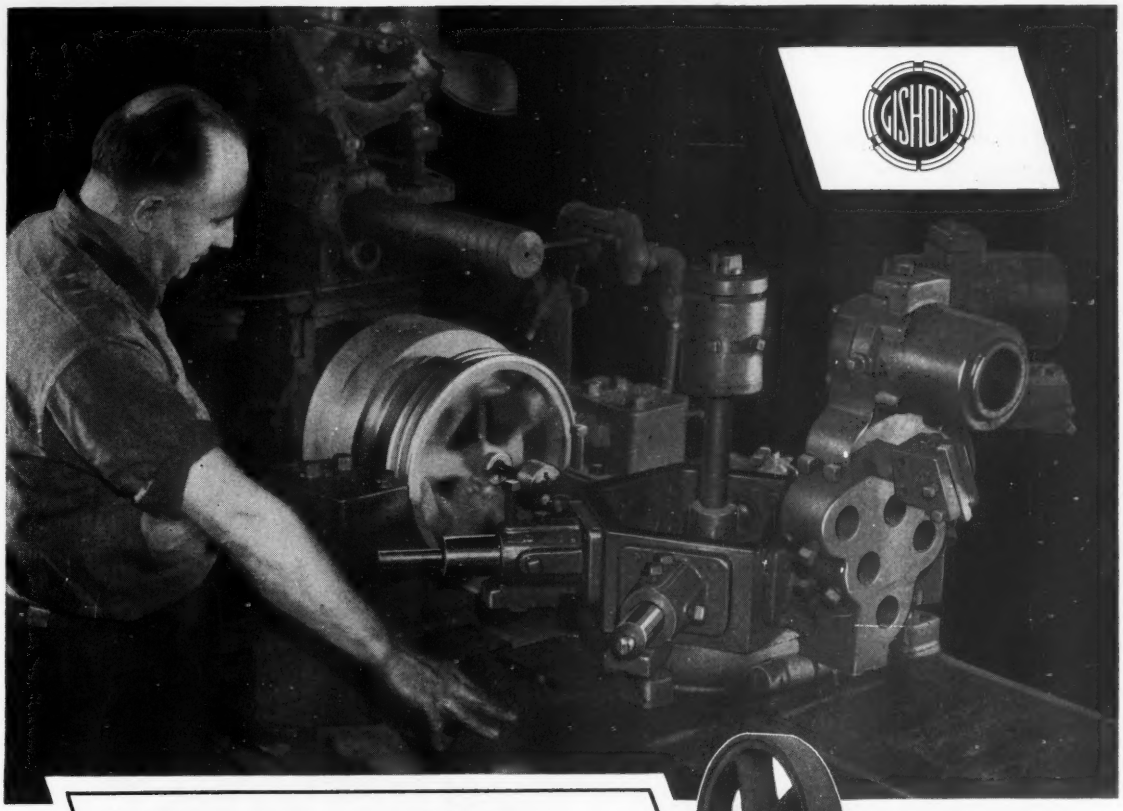
When you order McLouth Stainless Steel you get the exact gauge, finish and temper for the job. This means increased unit production.

McLouth Stainless Steel is made to your order in a wide range of grades and finishes. It has a high resistance to corrosion, heat and wear and is easily fabricated into your finished products. Laboratory control assures the exact chemical composition of the steel.

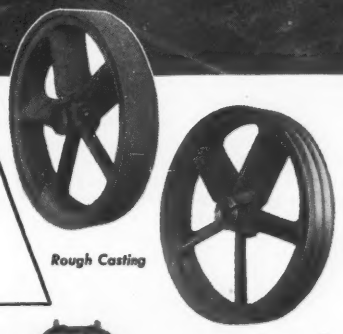
Ask for a McLouth Service Engineer to analyze your stainless requirements. If your product calls for stainless, *make it with McLouth Stainless Steel.*

McLOUTH STEEL CORPORATION
DETROIT AND TRENTON, MICHIGAN

HOT AND COLD ROLLED STAINLESS AND CARBON SHEET AND STRIP STEEL



Production Trebled by the FASTERMATIC!



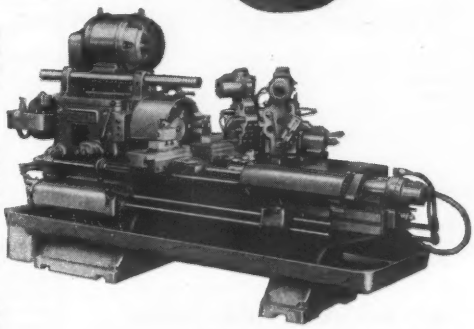
Rough Casting — Finished Sheave

Note here the rather simple tooling arrangement for machining cast iron sheaves. This setup, similar to regular turret lathe work, is made just as easily. But here, the machine performs 15 different operations—holds tolerances consistently—completes the entire machining job in 13 minutes. The former time was 39 minutes.

Completely Automatic Cycle

It's the swift, automatic cycle of the Fastermatic that accounts for such substantial time savings. With its hydraulic feed system and automatic speed control, the operator has only to load the chuck, start the machine and remove the finished work. Usually, the operator has time to tend a second machine.

Now, when you need still greater production, it is a good time to look into the Fastermatics. Write for the Fastermatic catalog.



THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

The Fastermatics are universal automatic turret lathes. Designed for accurate, high production turning, they can also be economically used on comparatively small lot work.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

IF YOU HAVE FLUID LINES TO CONNECT

YOU'LL SAVE TIME AND TROUBLE WITH

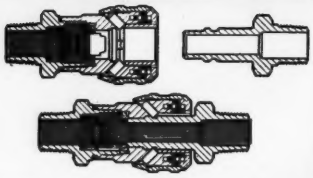
HANSEN

QUICK • CONNECTIVE COUPLINGS

HANSEN PUSH-TITE COUPLING

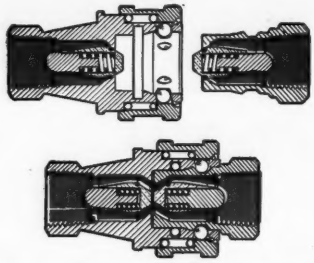
Shuts off one side of line

Gives quick connection and disconnection, with instant automatic flow or shut-off. To connect coupling, and open line to flow of fluid, merely push plug into socket. To disconnect, a slight pull on sleeve releases plug and shuts off supply end of line.



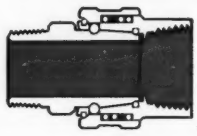
HANSEN HIGH PRESSURE TWO-WAY SHUT-OFF COUPLING

To connect, pull back sleeve and push plug into socket. Identical torpedo type valves permit free flow of gas or liquid through coupling. To disconnect, pull back sleeve..coupling immediately disconnects, valves automatically seal both ends of line. Can be mounted to disconnect automatically where fluid lines may be subject to sudden, damaging strain.



HANSEN STRAIGHT-THROUGH COUPLING

Provides quick connection and disconnection, but does not have shut-off feature. Size range for general use from ¼" to 2½". Two special types of straight-through steam couplings also available—one for low pressures, and one for high pressures.



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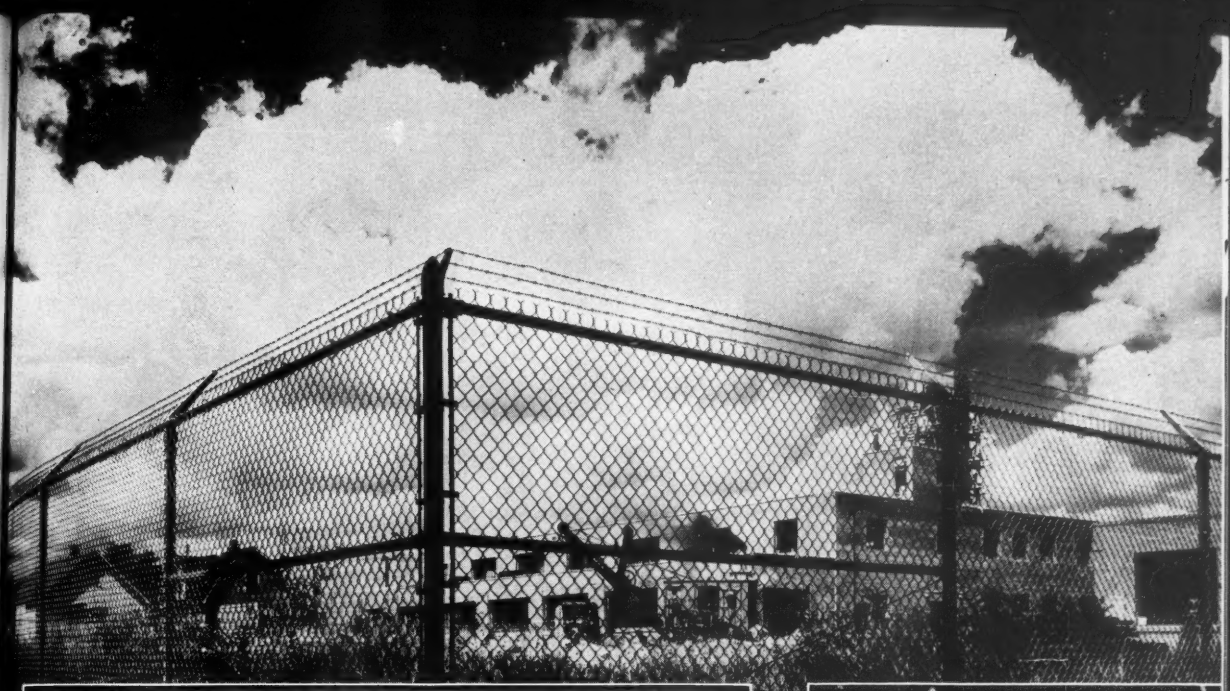

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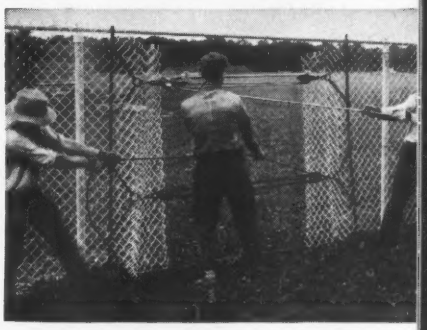
Continental's experienced fence engineers hel you plan and lay out fence, tailored to fit you property.



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Columbia STEEL & SHAFTING COMPANY

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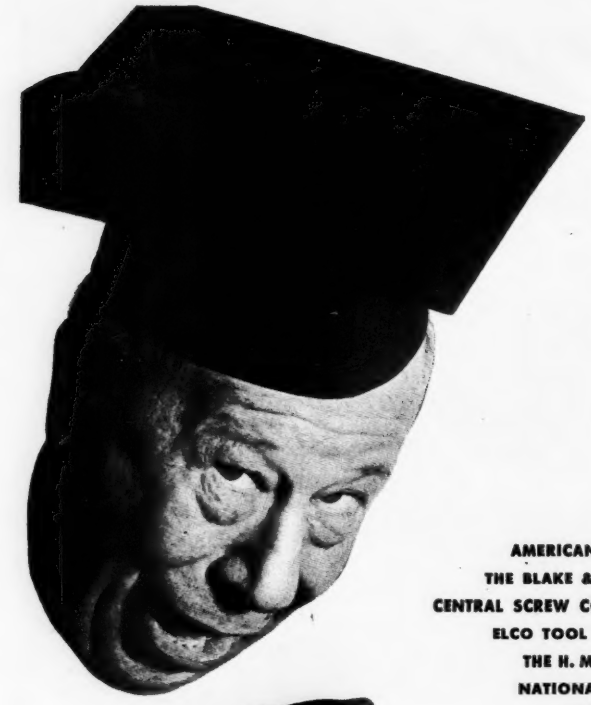

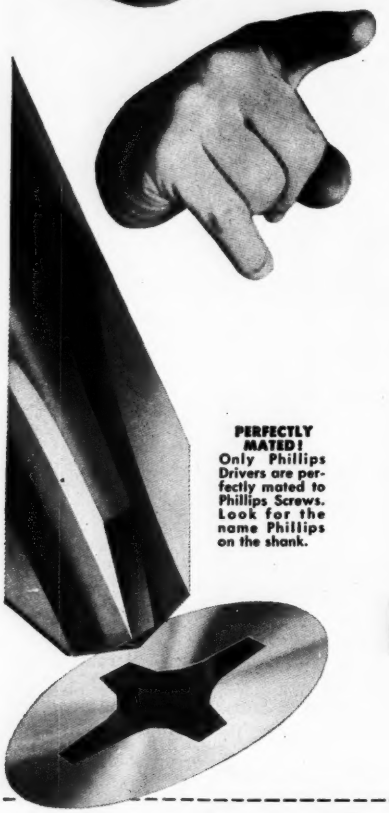

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ELCO TOOL AND SCREW CORP. • GREAT LAKES SCREW CORP.
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NATIONAL LOCK CO. • THE NATIONAL SCREW & MFG. CO.
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You can speed steel furnace bottom repair—save lost production time between heats—when you use Permanente 84 *periclase* ramming and patching mix.

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The high density and chemical purity of Permanente 84 minimizes penetration and attack of slag and metals. And it is dependable and easy to use.

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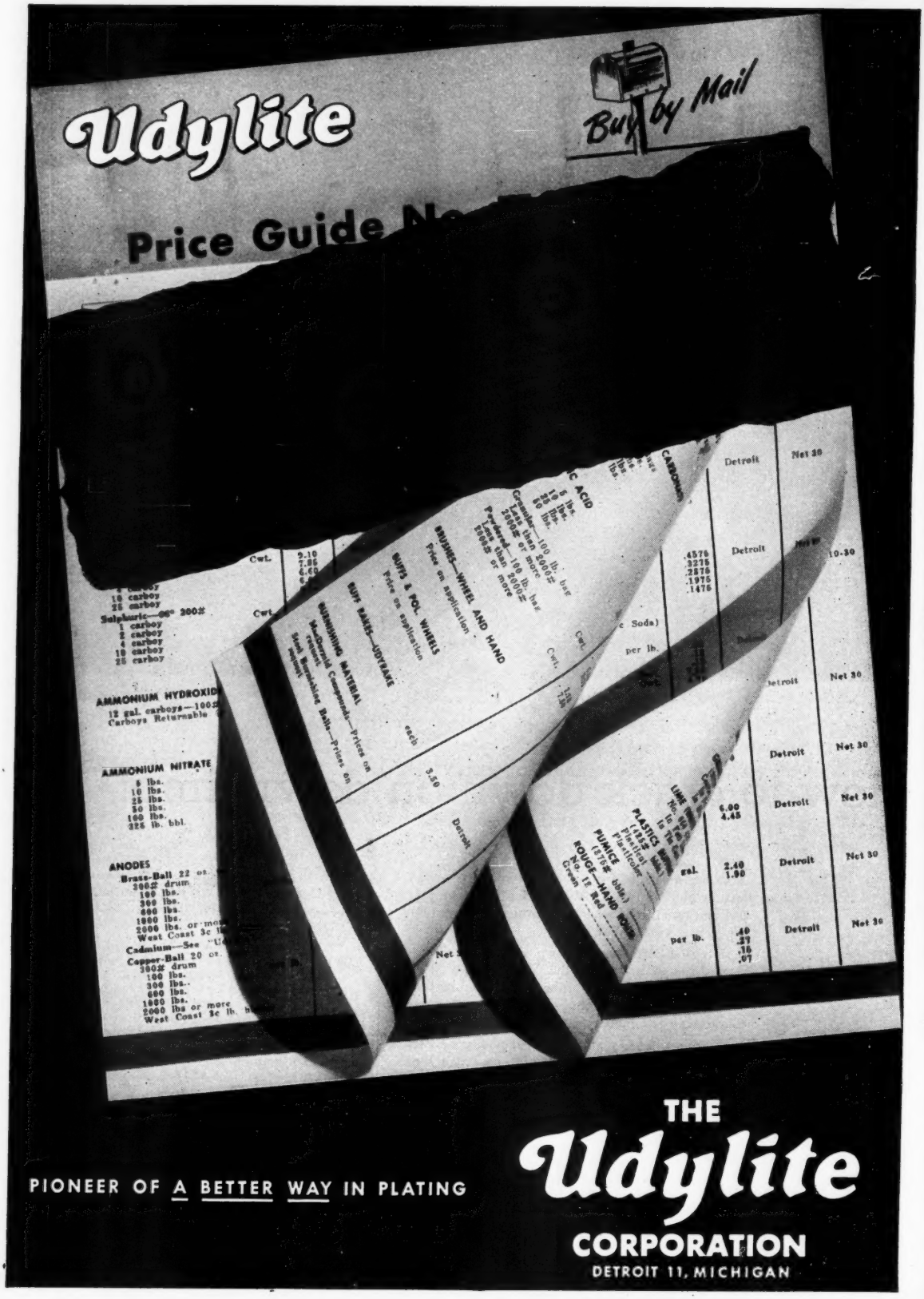
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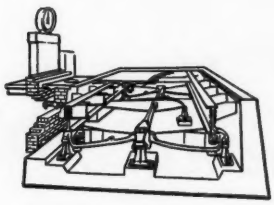
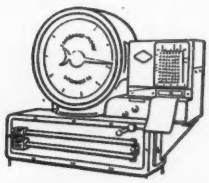
THE Udylite CORPORATION
DETROIT 11, MICHIGAN

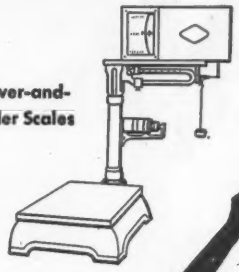


Truck Scales



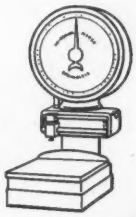
Printomatic Dial Scales

Over-and-
Under Scales

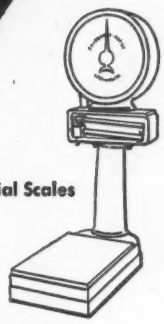


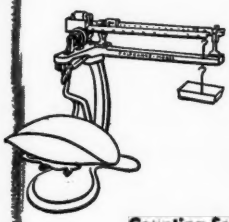
Type Registering Beam Scales

Bench Dial Scales



Portable Dial Scales



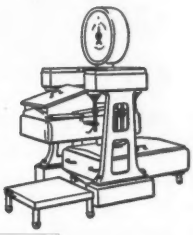


Counting Scales

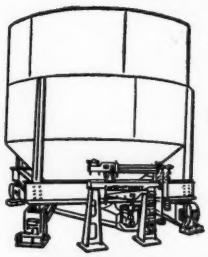
Speeds your weigh!

FAIRBANKS-MORSE,
a name worth remembering

SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

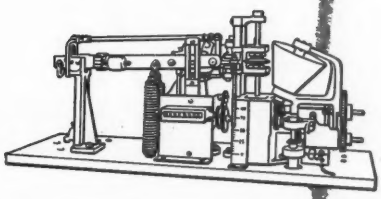


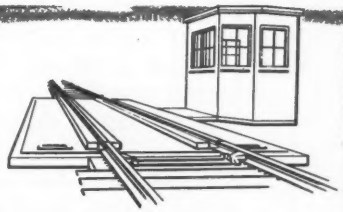
Weigh Can Scales



Hopper Scales

Belt Conveyor Scales





Railroad Track Scales

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois

F&Y HELPS THE NATION'S STEEL MILLS

...speed production with

PARALLOY

STEEL MILL ROLLS

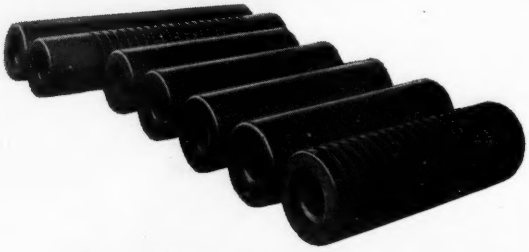
PINCH ROLLS

COILER ROLLS

TENSION ROLLS

Roll More Tons per Pass
No Scratching or Galling

500-600-BRINELL



Paralloy Rollers

Other F&Y Products of Proven Performance

- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—Traveling and Lifting Tables
- Continuous PICKLING Lines—ROLLER LEVELERS
- FURNACE Charging Equipment—Furnace Pushers
- Strip Steel COILERS and REELS—SCRAP BALLERS
- RAILROAD Spike Forming Machines—ROLL LATHES
- Sheet GALVANIZING Lines—Wire Patenting Frames
- Stretcher Levelers—Angle and Shape Straighteners
- Rolling Mill Tables—Gear and Individual Motor Types
- DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

8

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

BULLARD

MANUFACTURERS OF MACHINE TOOLS

A California Oil Field

Kaufman & Fabry Photo

The Invisible Background of Industrial Progress

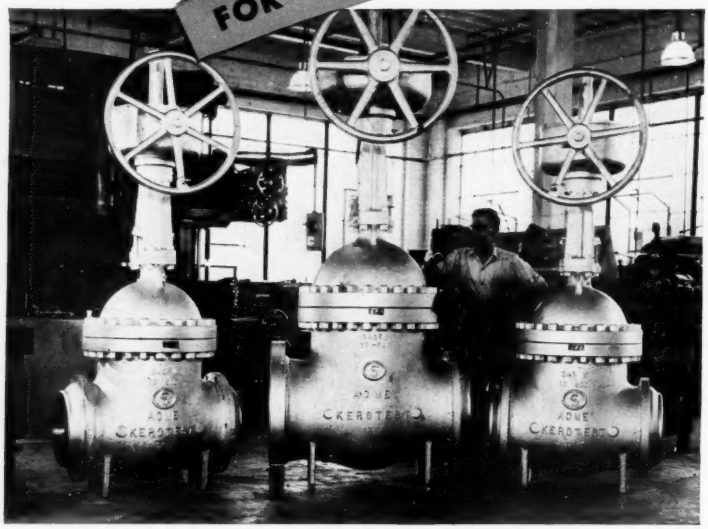
Although petroleum has been used to a limited degree for centuries its commercial importance dates from 1859, when Drake's Well in Pennsylvania was tapped. In the world of today, the pulse of nations beats to the throb of the Petroleum and Allied Industries. The many products — gasoline, fuel oil, petro-chemicals, certain alcohols, medicines and a host of others — make petroleum one of the greatest World Economic factors in peace and war. . . . Many large oil operations and better than 29 billions of untapped barrels underground make the United States the richest of all oil producing countries. . . . However, increasing consumption with requirements for reserves, necessitates constant research in scientific and mechanical fields. . . . Predominant in the Invisible Background are ★ *Modern Machine Tools* for the manufacture of equipment used for drilling, refining, transportation, pipe line and storage facilities — Machine Tools for manufacturing the items which consume petroleum products — those items which account for American leadership and modern living standards of a free people.

★ *For greater manufacturing economy*
REFER to next page

THE BULLARD COMPANY
BRIDGEPORT 2
CONNECTICUT

BULLARD MACHINE TOOLS

FOR GREATER MANUFACTURING ECONOMY



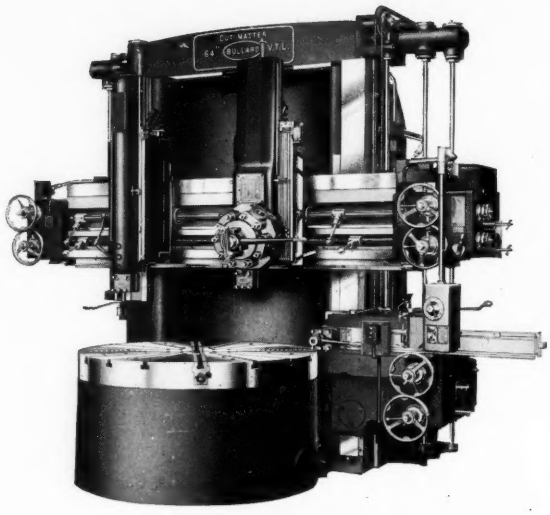
For economical manufacturing of many diversified types of work the Bullard Cut Master line of machines has been proven versatile, rugged and accurate for single-piece jobs or the longer runs where repetitive dimensions are required.

Simplicity and ease of operation quickly win approval of operators and increase the efficient productive output.

Today and the future call for greater efficiency in manufacturing methods throughout all industry. Heavier types of work, an ever-increasing demand for finished work in shorter spaces of time, better machine finishes on tougher materials, place upon Machine Tool manufacturers constant new problems of engineering and design.

Bullard Cut Master Vertical Turret Lathes in service are meeting these ever-increasing demands.

Not only valve work but many other classes of odd shaped cumbersome jobs are easily handled on these rugged machines. Whether the piece is large or small it is always easier to lay work down than it is to hang it up. Vertical type machines have this advantage. Where there is rough going, you'll find a Bullard Vertical Turret Lathe.



Boost your production efficiency with Cut Master economy. If you have problem jobs, call in a Bullard Engineer.

BULLARD

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

"Save with SIMONDS" Forged

Rotary Shear Knives

So says anyone who slits any type of sheet or strip metal. For they *know* that these "Red Streak" Knives cut straighter, cleaner, *and longer between sharpenings* . . . because they're forged and micro-finish ground. Forging condenses the grain structure — prevents nicking. Micro-finish grinding permits non-ferrous metal slitting without "pick-up."

Designed for specific shearing applications, these long-lived knives are made from 3 types of steel forged in Simonds' own mills . . . High Chrome, Special Alloy and High Speed. Send for free "Shear Selector" chart or ask for a "Simonds Man" to help with your slitting problems.

Cross-section showing "Tungsweld" High Speed Steel inlaid cutting edge.

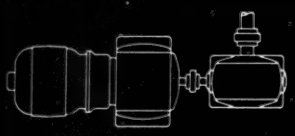
. . . and Squaring Shears

This "Tungsweld" Squaring Shear far outlasts other types . . . causes less down-time . . . gives far faster, cleaner shearing of tin plate, silicon, monel, stainless and other thin sheet metals . . . all because of Simonds' special method of welding a high-speed steel inlay to tough steel backing. Order a set today made to your exact specifications and "Save with Simonds."

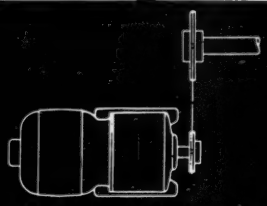
SIMONDS SAW AND STEEL CO.

FACTORY BRANCHES IN: *Boston, Chicago, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que.*

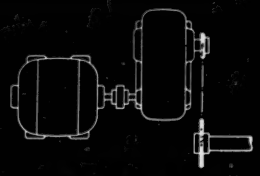
Is your speed reduction problem in this picture?



High-ratio reduction and right-angle takeoff

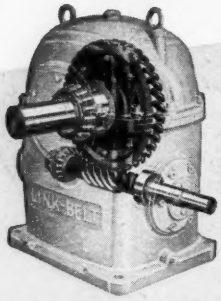


Restricted Space for mounting



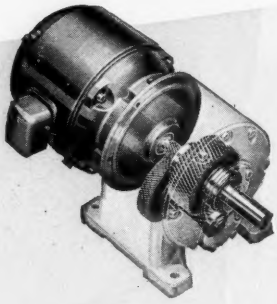
High hp with parallel takeoff

If it is, LINK-BELT has the right reducer for your requirements



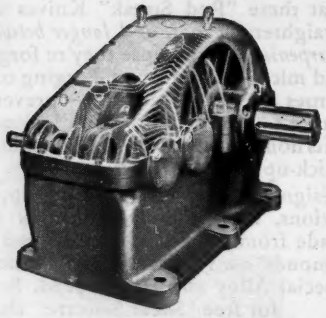
Worm Gear Drive

Reduction ratios: 3.1:1 to 8000:1. Torque: 1400 to 123,000 in. lbs. Output shaft rpm: 0.22 to 564. Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.



Gearmotor

Reduction ratios: 6.2:1 to 292:1. Hp range: 1 to 30. Output shaft rpm: 6 to 280. Drawing at top of page shows gearmotor with roller chain drive.



Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1. Hp range: ½ to 1000. Output shaft rpm: 2 to 600. Drawing at top of page shows motor with herringbone gear drive and roller chain drive.

Yes, LINK-BELT builds all 3

HELICAL, Herringbone or Worm gear drive—Link-Belt builds them all. And all are made in the widest range of hp ratings and reduction ratios. Truly a specific drive for every reduction problem.

All of this enables the Link-Belt power transmission engineer to recommend the *one* drive best suited to your requirements. And you can be equally sure that every Link-Belt drive is precision engineered for quiet, economical, long-life service.

Call the Link-Belt office near you for engineering information on any or all of these enclosed gear drives. Send for catalogs.

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,681

"Never again will I buy anything of theirs!"

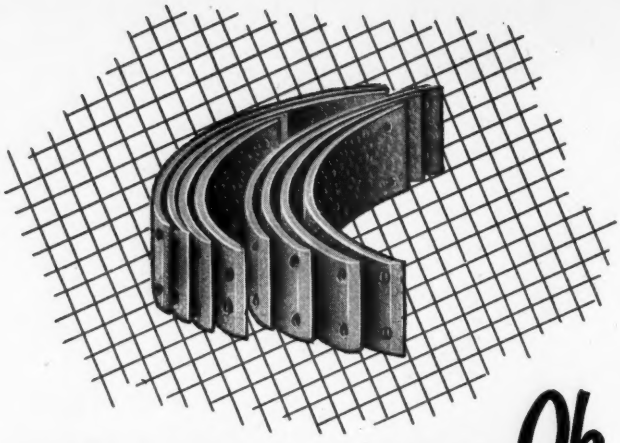
BEWARE the fury of a woman who finds she's been sold something with fasteners that stain fabrics . . . or leave a greasy "ghost-mark" . . . and also fail to live a useful life as long as that of the garment itself.

And who can blame her? Especially when she's the victim of *an unnecessary substitute for Brass.* For whether she knows those fasteners are Brass or not, she knows she has no trouble with them in any way! And neither do fastener manufacturers (or any other Brass-fabricators). For *there is no substitute for Brass* in ease of forming and annealing . . . or in freedom from "metallergies" like blistering.

Now what's all the shooting for? That's a question that ought to be asked much more often, when copper production is on the steady increase, both here and abroad, to an extent which recently prompted the world's largest producer to say this: "On the basis of the facts, there is no need to consider long-range substitution of other materials for the red metal". So whether you are a user or fabricator of Brass in anything from fasteners to refrigerators . . . *stand fast, and don't settle for less.* You'll get it, and sooner than you think.

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best



BETTER WIRE—BETTER BRAKE LINING? Oh, YES!

for Automobiles . . . Trucks . . . Motorcycles

Farm Implements . . . Hoists . . . Tractors

Earth Moving and other Industrial Machinery

REYNOLDS WIRE protects performance

Who makes the brake lining? The answer is important to automotive, agricultural and other industrial users.

But who makes the wire cloth that reinforces the brake lining?

That, too, is important. To the makers of the brake lining. To those who build brake lining into their motor cars, trucks, buses, farm implements, contractors' and other kinds of machinery. And to the users of those machines.

Because the better the wire, the more dependable and the more uniformly effective the braking. And it prolongs the wear and adds to the service life of the lining.

There is no better reinforcing agent than Reynolds Wire Cloth—for all compounds, plastics, rubbers, and building materials.

For the automotive and all other "precise specification" industries, Reynolds is made to meet special requirements—by engineers with 50 years' specialized know-how, using the most modern equipment and methods. Consultation without obligation.

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO.
DIXON, ILLINOIS

Divisions of National-Standard Co.

ATHENIA STEEL...*Clifton, N. J.*.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...*Niles, Mich.*.....Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...*Jersey City, N. J.*.....Metal Decorating Equipment
WORCESTER WIRE WORKS...*Worcester, Mass.*....Round and Shaped Steel Wire, Small Sizes

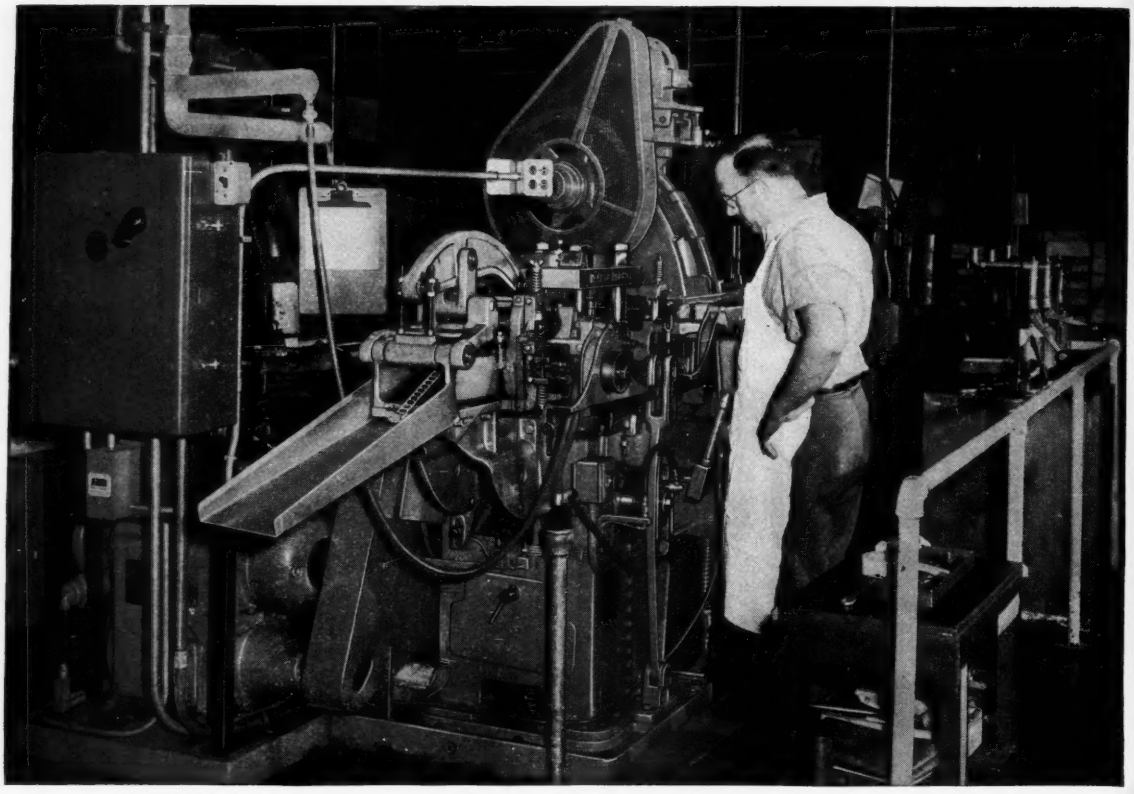
NS NATIONAL-STANDARD Company NILES, MICHIGAN

if all the operators of all the machine tools now in use could improve their efficiency by only 5%, they would add more to the nation's output of metal products than could be produced by all the new machine tools built in any one year.

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, AND TAPPING MACHINES

Sperry Boosts Rotor L



In many of the devices manufactured by Sperry Gyroscope Company, a division of the Sperry Corporation, rotors are important components. Speed of production is essential, but so is accuracy. Sperry's rotors are smaller than industrial types and the laminations must be held to closer tolerances.

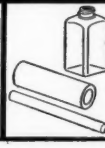
Normal production of laminations was 750,000 per month, using conventional overhead crankshaft presses. With the Henry & Wright Dieing Machine, production zipped up to an average of 3,500,000 laminations per month, an increase of about 367%. In addition, die life has been lengthened and more pieces are produced between grinds.

OTHER EMHART PRODUCTS INCLUDE:

PREMIUM QUALITY STAMPING PRESSES
THE V & O PRESS CO.
Division of Emhart Mfg. Co.
HUDSON, NEW YORK

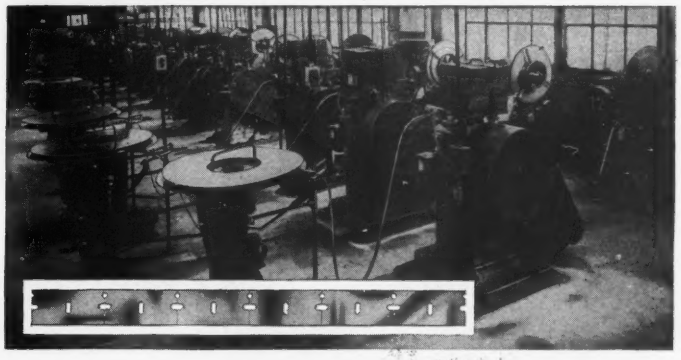
GLASS MAKING MACHINES
HARTFORD-EMPIRE CO.
Division of Emhart Mfg. Co.
HARTFORD 2, CONNECTICUT

AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
Division of Emhart Mfg. Co.
PORTLAND, CONNECTICUT

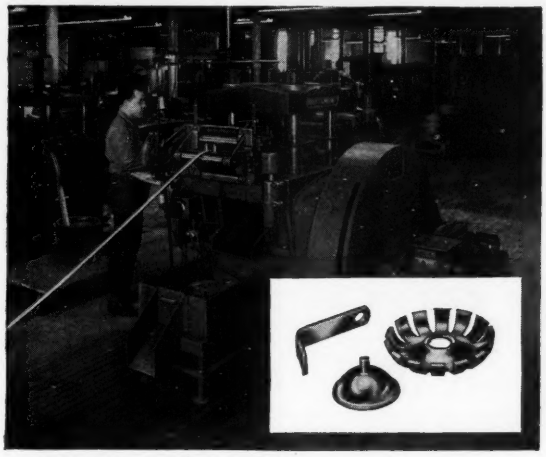


PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
HARTFORD 1, CONNECTICUT

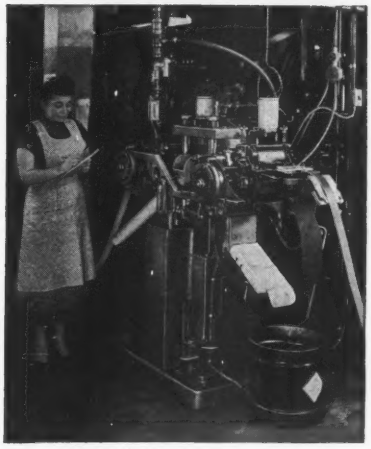
Lamination Production 367%
with Henry & Wright Dieing Machine



First of many steps in production of razor blades at American Safety Razor Corporation is accomplished on 11 Henry & Wright Dieing Machines. Each machine perforates and scores the razor blade strip at an average rate of 30,000 per hour.



Faster, lower cost production of precision parts for automatic fire protection sprinklers is reported by Grinnell Company as a result of using Henry & Wright Dieing Machines. Grinnell states, "these are precision parts held to close tolerances . . . turned out much faster and at a considerably lower cost than was possible with older methods."



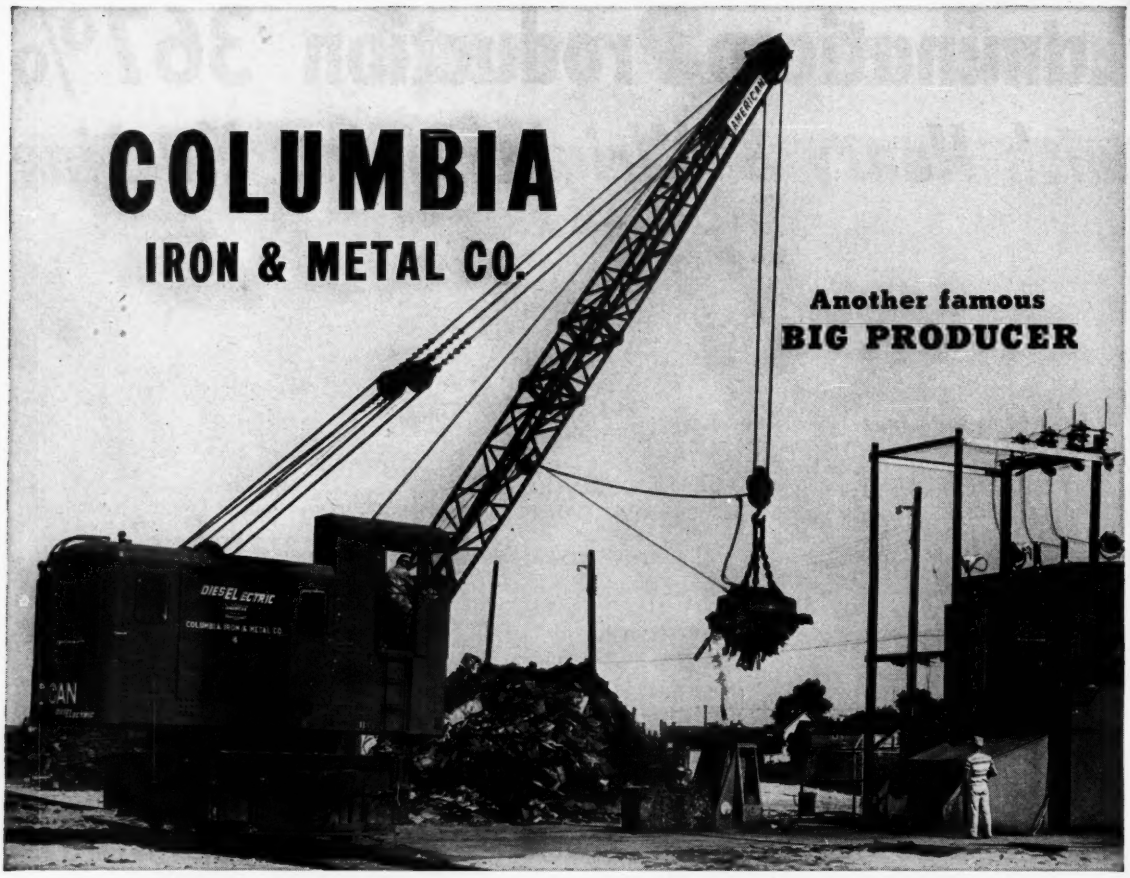
Two strips of steel are fed simultaneously from opposite directions into the Henry & Wright Dieing Machine at Lufkin Rule Co. The two strips are stamped and then assembled by the Dieing Machine into a joint used in certain Lufkin rules.

Only the best is good enough

FACT PACKED CATALOG

Complete descriptions of all Henry & Wright Dieing Machines. Write: Henry & Wright, 442 Windsor St., Hartford 5, Conn.

HENRY & WRIGHT
Division of Emhart Mfg. Co.



How a fast-stepping scrap producer "beats the clock" with locomotive cranes

By television, radio, newspapers, magazines and word of mouth, every American citizen is being told that his country needs scrap metal . . . *right now.* If you would like some helpful ideas about handling that scrap, see Columbia Iron & Metal Co.'s work, at Youngstown, Ohio.

The watchwords at Columbia are *speed* and *volume.* For it is literally true that minutes mean money in the scrap business . . . and that profit may often be made or lost according to the tonnage handled per day.

To move mountains of scrap at top speed, Columbia Iron & Metal Co. has chosen American DiesELectric Locomotive Cranes. Today, seven of these ultra-modern machines, equipped with magnets, are at work in the Youngstown and Cleveland yards. And production records have proved over and over again that these superb cranes were indeed a brilliant investment.

Silken smoothness, high speed in every motion, easy operation, and astonishingly low upkeep . . . that's what you get in the American DiesELectric, with diesel power to the deck, electric power to the wheels. For scrap handling, or for *any* big production job, here's the *modern* crane you need.

2603
19

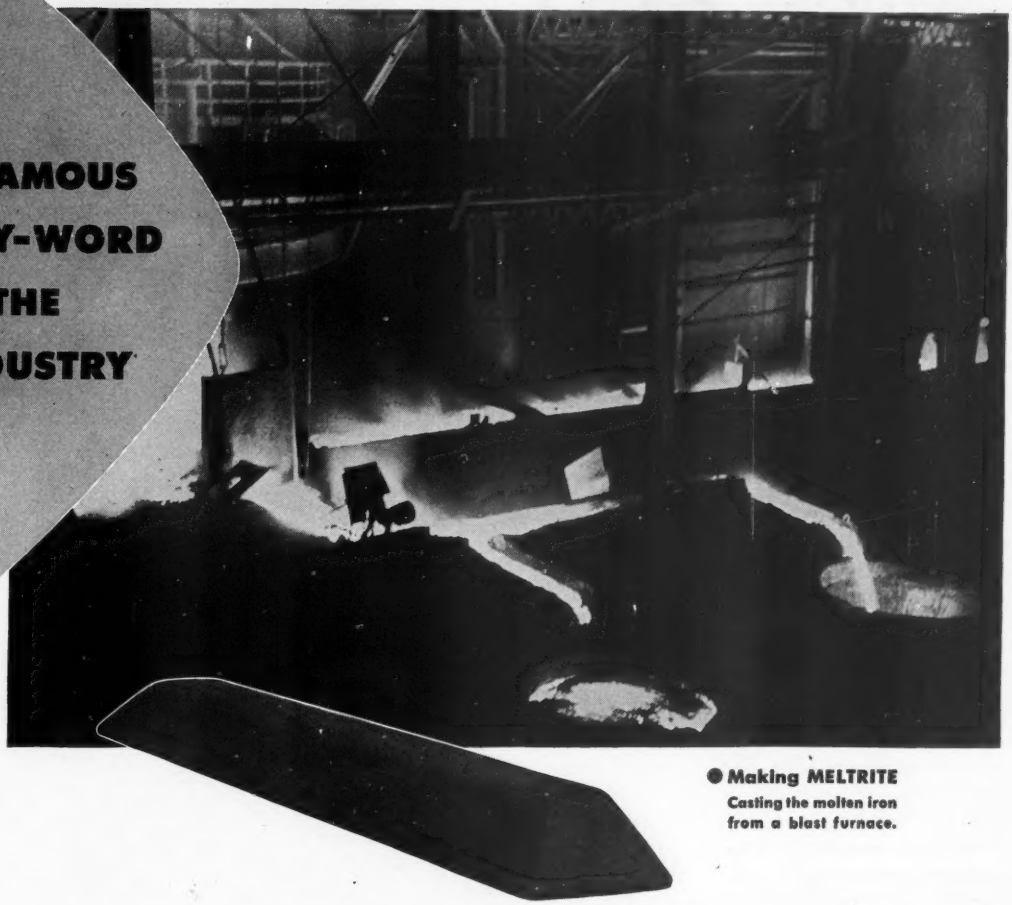
Modernize...economize...with

American Hoist
& Derrick Company
ST. PAUL 1, MINNESOTA

For the BIG PRODUCTION jobs of industry...
AMERICAN LOCOMOTIVE CRANES

MELTRITE PIG IRON

A FAMOUS BUY-WORD IN THE INDUSTRY



● **Making MELTRITE**
Casting the molten iron from a blast furnace.

MORE USED THAN ANY OTHER MERCHANT PIG IRON

P M

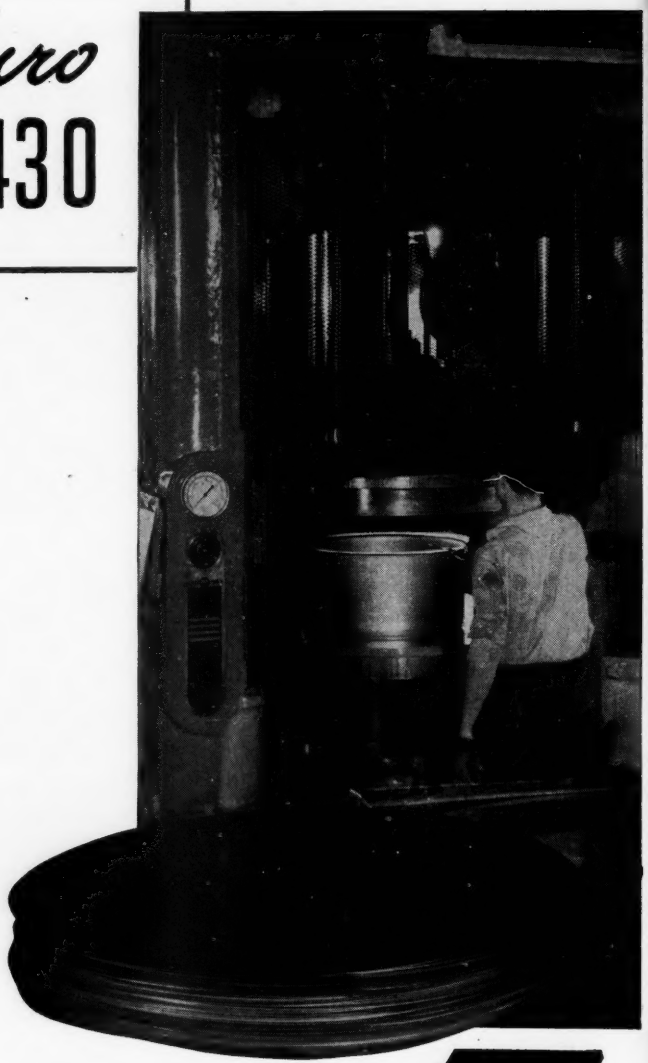
69 years of service to industry

PICKANDS MATHER & COMPANY
UNION COMMERCE BUILDING • CLEVELAND 14, OHIO
CHICAGO • CINCINNATI • DETROIT • DULUTH • ERIE • GRAND RAPIDS
GREENSBORO • INDIANAPOLIS • MINNEAPOLIS • ST. LOUIS • WASHINGTON
IRON ORE • PIG IRON • COAL • COKE

YOU STILL CAN HAVE

STAINLESS STEEL QUALITY

WITH *Enduro* TYPE 430



● In many cases, there is no reason today why current restrictions on nickel should deprive products of stainless steel quality. Many items formerly made from 18-8 types still can enjoy the advantages that only stainless steel can afford . . . by converting to Republic ENDURO Type 430.

Republic ENDURO Type 430 is not a new stainless steel. It has been in successful continuous service for 28 years in a wide variety of applications. Its corrosion-resistance is exceptionally good. It affords high yield strength. Its resistance to scaling and oxidation at elevated temperatures is high. It can be fabricated by all modern methods.

Many manufacturers already have converted to Type 430 or one of its modifications. Others are making plans to do so. Why don't *you* talk to a Republic Stainless Steel Metallurgist —and learn just how Type 430 can help you maintain stainless steel quality in your product? Contact your nearest Republic District Sales Office or write us.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

Send for this NEW BOOK

You'll find it filled with facts to help you consider conversion to Type 430—*fast*. Write to: Republic Steel Corporation, 3120 E. 45th Street, Cleveland 27, Ohio.

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REPUBLIC STEEL

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Tubing, Lockers, Shelving, and Fabricated Steel Building Products

Built-In STAMINA

. . . ANOTHER REASON FOR THE "SUPER-LIFE" OF ATLAS CHAIN

Every component in a link of roller chain plays an important part—the bushing, the pin, the link and inside plate, the roller. Each must pull its share of the load—each must be heat-treated so that it takes more than its share of the punishment. Otherwise, premature chain maintenance and replacement.

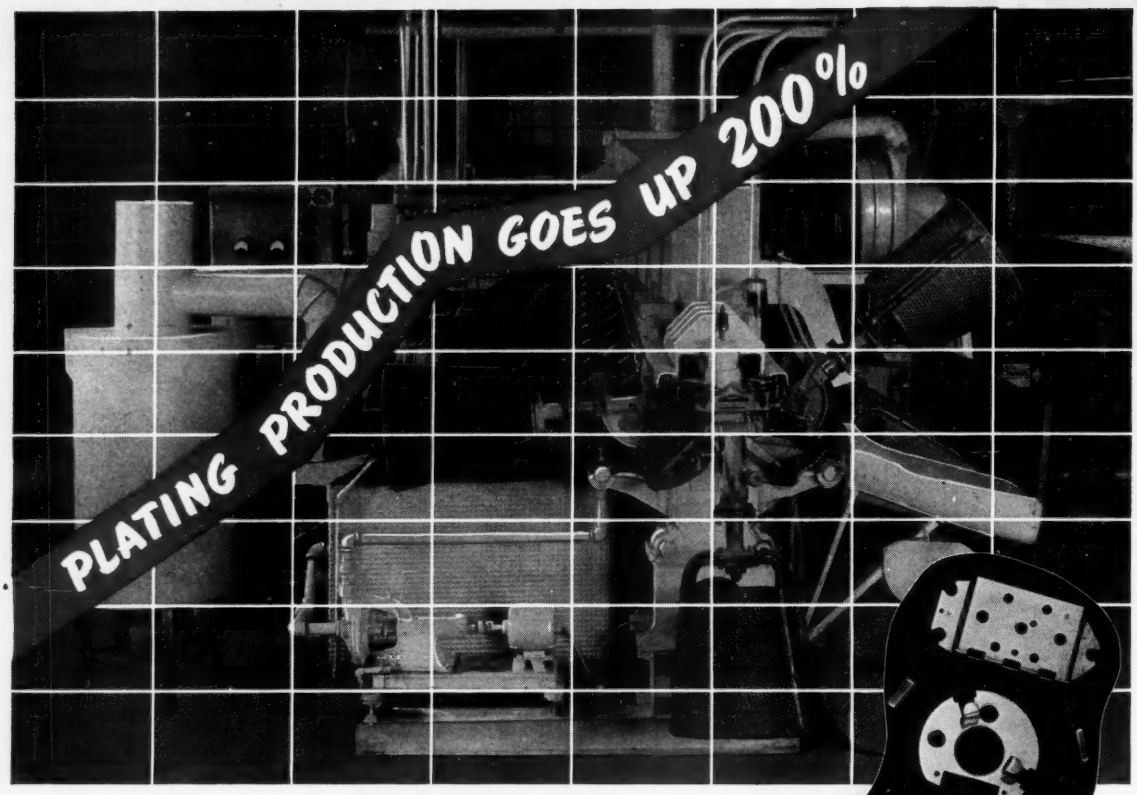
The Atlas Nicarb Process used for case hardening bushings and pins is one big reason for the stamina of Atlas "Super-Life" Chain. Nicarbing provides an outer surface strongly bound to the core of the steel which provides greater strength and wear resistance. The link plates and rollers are also made of tough, heat-treated alloy steel; their uniformity achieved with automatic electronic instruments which control the furnaces.

Yes, every component part of Atlas "Super-Life" Chain is made to have the maximum of inherent strength. This means greater efficiency—greater economy—on every drive!

Investigate today the chain that keeps on running after ordinary chain is out of service. Write: ATLAS CHAIN and MANUFACTURING COMPANY, Kensington & Castor Avenues, Philadelphia 24, Penna.

"SUPER-LIFE"

ATLAS CHAIN



WITH STEVENS AUTOMATIC BARREL PLATING MACHINE

at Midwest Plating & Chemical Corporation

Here again is convincing testimony of how a Stevens automatic machine captures high levels of productivity in automatic plating.

Mr. Phillip A. Young, Treasurer of the Midwest Plating and Chemical Corp., Kokomo, Indiana, goes on record to cite the superior production performance of a Stevens automatic barrel plater.

Here is what Mr. Young has to say, **"After installing a Frederic B. Stevens Automatic Barrel Plating Machine we immediately realized these outstanding benefits:**

1. **Increase in production of 100 to 200% over other present facilities.**
2. **Less man-power needed.**
3. **Fully automatic processing, including drying.**
4. **Savings of plating materials. Salvage tank for plating materials included in the machines.**
5. **Better current distribution on the plated work.**

"We feel this Stevens machine is the best piece of automatic barrel plating equipment for small parts on the market today."

There you have it – real customer satisfaction! You, too, can apply these profit-making benefits to your plating operations by installing Stevens equipment. Your nearby Stevens Representative can tell you how you can UP your plating production and reduce your unit-cost with Stevens Full Automatic Machines. Call him today or write direct. There's no obligation.

DEFENSE APPLICATIONS OF THE STEVENS AUTOMATIC BARREL

1. Washing and cleaning.
2. Blackening applications.
3. Aluminum processing.
4. Phosphate coat treatments.
5. Plating.
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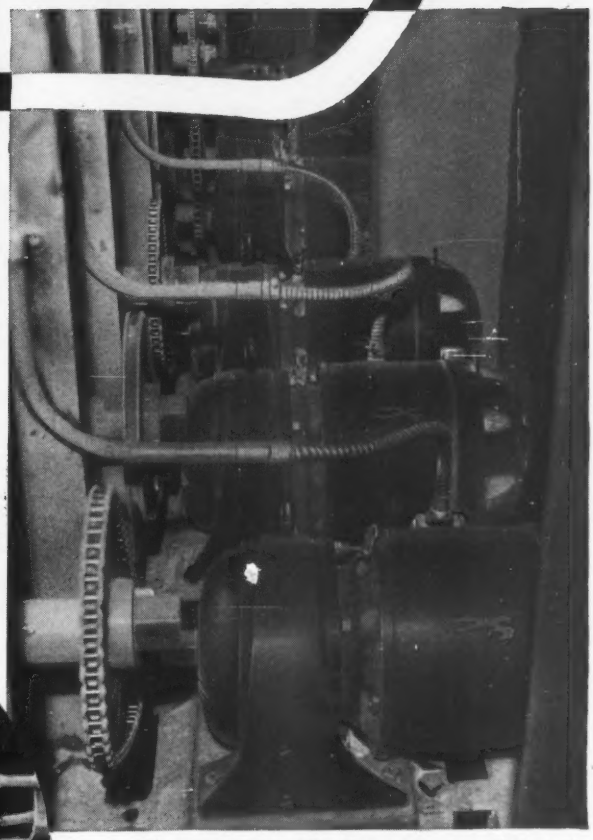
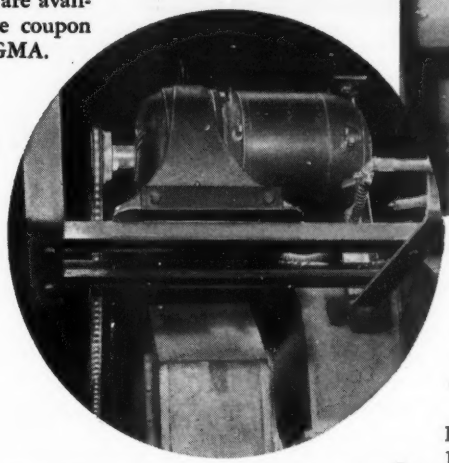
Here is a battery of Foote Bros.-Louis Allis Gearmotors at work for the International Milling Company in Detroit. Enduring heavy loads under excessive dust conditions, these units are providing positive, uniform power, day in and day out, under rugged service.

These Gearmotors incorporate Duti-Rated Gears with file hard surfaces and resilient cores, assuring maximum strength in minimum size. The cast iron housings give rigidity, and the large oil reservoir with splash lubrication means continuous, trouble-free operation.

Foote Bros.-Louis Allis Gearmotors are available in single, double and triple reductions to provide output speeds of 780 down to 7.5 r.p.m. Capacities from 1 h.p. through 150 h.p. Open drip-proof, splash-proof, enclosed and explosion-proof motors are available. Mail the coupon for Bulletin GMA.





Foote Bros.-Louis Allis Gearmotors installed at the International Milling Company, Detroit, Michigan.

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
Dept. X, 4545 S. Western Blvd. • Chicago 9, Illinois

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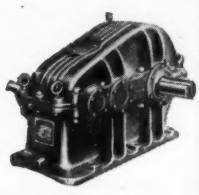

Maxi-Power Drives

Foote Bros. Gear and Machine Corporation
Dept. X, 4545 South Western Boulevard
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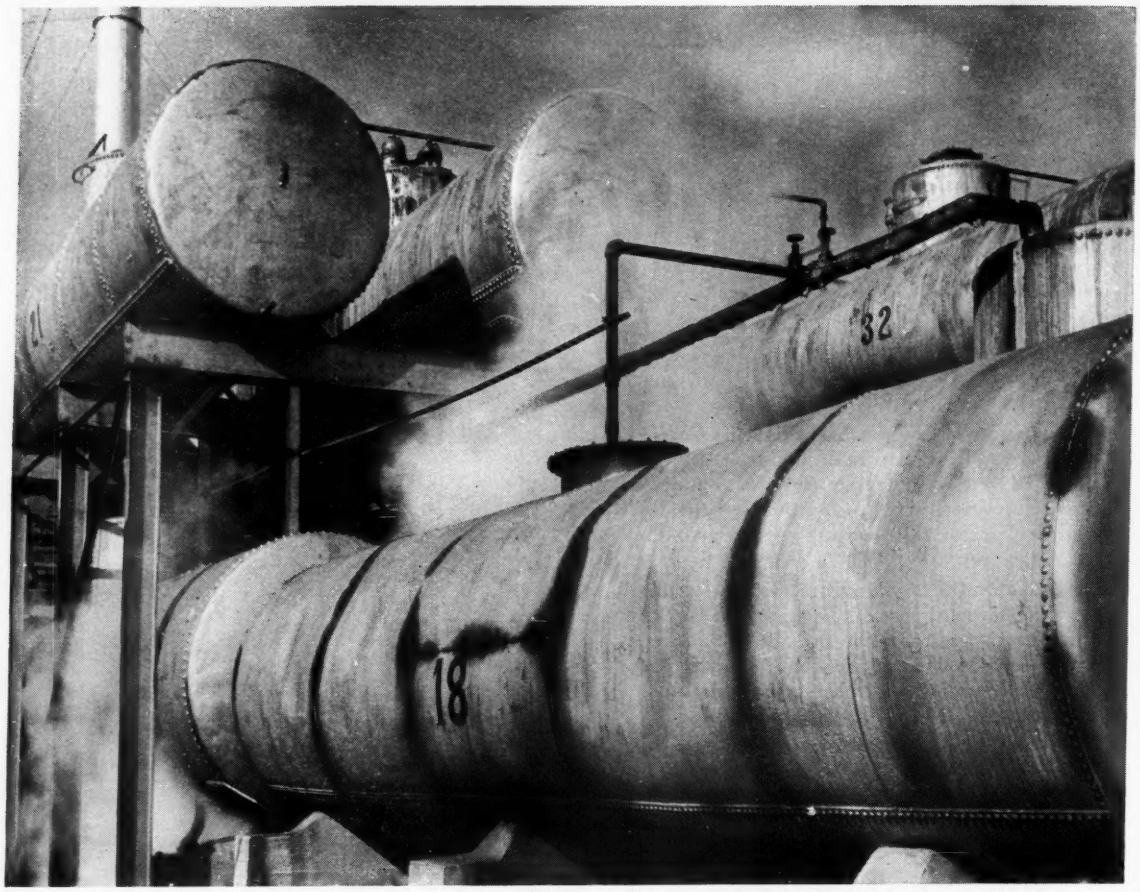

Not half a world away . . . but right in the heart of the industry. In this battery of heated tanks, newly made Palmoshield is stored, ready for immediate shipment.

Buy it as you use it...

Palmoshield service eliminates stockpiling

Threats of war . . . shipping uncertainties . . . materials shortages. These headaches fade away when you use Palmoshield as the essential lubricant in your rolling operations.

For Palmoshield is an all-American product made from freely available domestic materials right in the heart of the steel industry. As a Palmoshield user, you are not dependent on overseas shipment from foreign-controlled sources. So you need not tie up space or funds in stockpiling.

A call to Ironsides in nearby Columbus brings overnight shipment in emergencies. Where requirements are established, a delivery schedule can be set up which assures your receiving Palmoshield on a regular basis.

Now tested and proved in commercial use
Within a few months Palmoshield has been accepted by most major steel companies for on-the-job test runs or actual mill operation. Results substantiate findings in three years of pilot tests:

—that Palmoshield duplicates every chemical characteristic of imported palm oil.

—that it looks, feels, acts, handles like the imported product.

—that it requires absolutely no changes in rolling mill operation.

—that it is superior to palm oil in being subject to exact chemical control. You can specify free fatty acid content to ½%—and get it.

Palmoshield is available for immediate shipment in 55-gallon drums and in tank car lots. Competitively priced. For details write The Ironsides Company, 270 West Mound St., Columbus, Ohio.

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IRONSIDES SHIELD PRODUCTS **PALMOSHIELD**

This man is on our payroll . . . but he works for you!

Not just a Social Security number or a name in a file — not just the Bolt & Nut salesman who comes around occasionally.

A Sterling Bolt representative is a genuine, real and helpful human being. And like all of us, he is doing the best job he can.

Every company likes to think of their men as the best available. Sterling Bolt Company feels that way too.

Of course, we try to sell bolts, nuts, screws and washers to as many companies as will buy them, but the bigger job— that of keeping customers satisfied and keeping satisfied customers—is the goal towards which we have worked, day-by-day for more than thirty years. And we take our hats off to our salesmen who, though on OUR payroll, work for you.

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DEVLIEG SPIRAMATIC JIGMIL®

Series "B" and "C" PRECISION BORING and MILLING MACHINES

The new range of ***SPIRAMATIC*** JIGMILS incorporates two important developments in the field of precision boring . . .

1. ***SPIRAMATIC*** SPINDLE HEAD—with constant mesh helical gears and preselective automatic speed changing mechanism.

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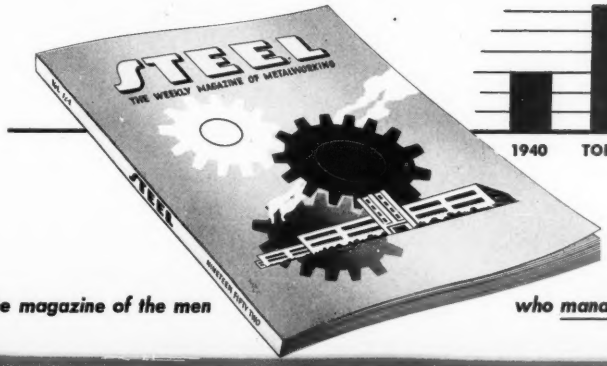
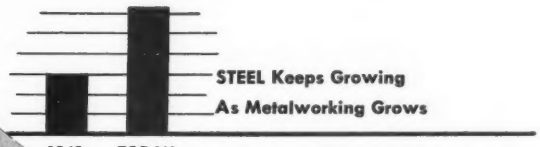
IN 1940...
Houston, Texas, boasted 146 metalworking plants employing 18,034 workers and produced about $60,000,000 in metalworking products.
TODAY...
28,840 workers are employed in 308 metalworking plants—over twice as many as 1940. And nearly $400 millions in metal products are being manufactured in Houston today!

Similar growth throughout the Metalworking Industry means tremendous sales opportunities for you!

In Erie, Cleveland, Detroit, Schenectady . . . throughout Metalworking America . . . the same tremendous growth has taken place during the past decade! The number of plants has *doubled* or more. *Twice as many* workers are employed by Metalworking today. And the sales potential in your metalworking market has jumped from $40 billions in 1940 to over $100 billions today. When a market's growing like Metalworking, you need an advertising medium that's *growing with it*, to keep ahead of competition! Ask the man from STEEL to show you how STEEL matches its circulation to the dynamic growth of the Metalworking industry.
STEEL • Penton Building • Cleveland 13, Ohio





Closely matching the growth of Metalworking, STEEL has more than doubled its circulation since 1940!

The magazine of the men who manage, operate and buy for the Metalworking industry

How a Monel Pickling Chain made a comeback

...after 6 years in a hot Sulphuric Bath!

At Youngstown Welding & Engineering Co., new Monel links are welded into this Monel chain which had been attacked at the acid level after six years in hot sulphuric pickling bath. Reconditioning Monel pickling equipment after years of service saves in replacement costs.

Corrosion attacks pickling equipment viciously at the acid level – the zone where acid meets air.

So the owners of a wrought Monel® chain learned... when after six years of service they found the links at this point were gradually being destroyed. As the rest of the chain was in good condition they decided to have it reconditioned and the weak section replaced. At the Youngstown Welding & Engineering Company where the corroded section was cut out, new links of Monel were welded in with an oxy-acetylene torch.

Now the chain is back, ready for many more years of service.

Pickling chain is only one example of where Monel equipment fabricated by Youngstown Welding & Engineering Co. can give extra-long service life... and can then be reconditioned for additional years of use.

Strong, corrosion-resisting Monel can help you obtain substantial savings in replacement and maintenance costs in all types of pickling equipment... crates, hooks, tie-rods, racks. And because Monel is so strong, you can have lighter equipment which means increased payloads.

"Where Monel Pays Its Way in PICKLING," has been specially prepared to show you how useful Monel can be. Why don't you write for your free copy, now?

And remember, Monel is on extended delivery because so much is needed for defense. So it will pay you to order well in advance. Be sure to include your NPA rating and complete end-use information.

Here's how the chain section at the acid level looked after six years of service. These original links were flash welded. Replacement links are formed from Monel rod and gas welded.

Here's how the chain looked after the corroded links had been cut out and new Monel links were welded in by oxy-acetylene torch. Now it is ready for many more years of rugged duty.

INCO TRADE MARK

Monel PICKLING EQUIPMENT

extra life
extra capacity
extra safety

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

June 2, 1952

Controls Hinder Copper

Government controls are intensifying the scarcity of copper. For fear of not having copper when they want it, consumers are taking it whether they need it or not. A proof of this, says Whipple Jacobs, president of Phelps Dodge Copper Products Corp., is that the number of spools and reels on which it ships copper has steadily and substantially increased in the hands of its customers for the last 15 months. In a number of instances the company's customers have had to defer deliveries because their inventories have reached the maximum legal limit.

They Don't Want Them

In a May survey by the purchasing agents, they found that 87 per cent of the buyers want controls on prices and materials eliminated or modified (p. 63). Many business men now believe that ceiling prices are tending to hold prices at ceiling and not let them drop below. They believe that industrial suppliers would reduce prices if they were assured that the reduced prices would not become the new ceiling prices under the Office of Price Stabilization.

More Metal for Civilians

Third quarter allotments of steel, copper and aluminum will be more liberal than ever for civilian-type products. Carbon and alloy steel allotments are 50 per cent of the base period in this second quarter, but will be 55 per cent in the next period. Brass mill and foundry allocations are 30 per cent now, will be 35 per cent in the third quarter. Copper wire mill allotments will rise from 35 per cent now to 40 per cent. Aluminum for civilian products shows the biggest jump—from 30 to 45 per cent.

Die Makers Seek Expansion

Tool and die manufacturers are among those small companies campaigning for a better deal on defense expansion. Small Defense Plants Administration has worked out a plan with Defense Production Administration that is supposed to assure small firms of more certificates of necessity (p. 69). It remains to be seen how well it works. Watch for an explosion on the way defense expansion certificates are handled if small firms don't get a bigger share soon.

Target for Small Business

The House Committee on Small Business, a powerful group, is now pushing the Defense Department to establish a percentage target for direct participation of small business in military procurement. The World War II percentage reached 35, and that's the proportion the committee now suggests. In fiscal 1949, small business got 27.2 per

Production-Engineering News—p. 91 *The Market Outlook—p. 167*

cent of the defense business; 24.5 per cent in fiscal 1950; 20.9 per cent in fiscal 1951; 17.6 per cent in the first eight months of fiscal 1952.

Sixty Per Cent for 100 Firms

The Munitions Board procurement report for July, 1950, through December, 1951, shows that 100 corporations received 59.9 per cent of the total dollar value of all military procurement. For July, 1950, through March, 1951, the percentage for those same 100 was 55.3, a rise of 4.6 per cent.

Dondero Charges on IMC

Manly Fleischmann leaves his post as defense production administrator right in the middle of a fight with House Republicans over the International Materials Conference. That group is responsible for world allocations of nonferrous metals, and U.S. participation in it is largely at the instigation of DPA. The House critics, led by Rep. George A. Dondero (Rep., Mich.), charge that IMC has short-changed America on copper. Mr. Fleischmann calls the charges "another unfortunate instance of incorrect conclusions reached from inaccurate information." The new DPA administrator, Henry H. Fowler, will have to carry the ball on the matter.

Engineering Graduates All Set

College graduates, especially engineers, will have little trouble getting jobs right after they leave school—if they aren't drafted first. Illinois Institute of Technology reports that dozens of job opportunities with starting salaries that average $332 per month are being pressed upon its engineering students.

Straws in the Wind

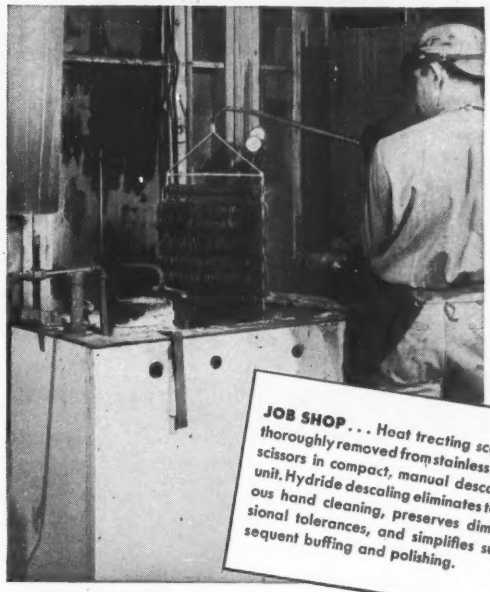
National Steel has less and less interest in the proposed steel mill at Paulsboro in southern New Jersey . . . General Motors' Frigidaire Division cut prices on refrigerators, ranges, other appliances; the trade says the reductions (up to $45 on one refrigerator model) were to meet competition . . . White-collar workers in the steel industry are eligible for pay increases comparable to any won by the C.I.O. under a salary stabilization order . . . Construction firms as well as producers are limited by CMP Regulation 2; they may not accept steel and aluminum deliveries if inventories exceed 45 days . . .

What Industry Is Doing

Sluggish summer weather for industry is forecast at National Association of Purchasing Agents' convention (p. 63) . . . General unemployment is easing, but more hardship areas are cropping up (p. 63) . . . Refractory manufacturers are living on borrowed time as labor contracts expire (p. 66) . . . Defense production pools are finding orders hard to get (p. 68) . . . U.S. iron powder makers are contesting Sweden's domination of the field (p. 74) . . . Future market for air conditioners looks good (p. 75).

NO SECTION TOO BIG . . . NO PART TOO SMALL

STEEL MILL . . . Heavy plates of stainless steel, nickel and high nickel alloys are treated in the hydride bath for uniform removal of hot rolling and annealing scale. High speed of the descaling process increases production capacity . . . cuts costs.



JOB SHOP . . . Heat trecting scale is thoroughly removed from stainless steel scissors in compact, manual descaling unit. Hydride descaling eliminates tedious hand cleaning, preserves dimensional tolerances, and simplifies subsequent buffing and polishing.

FOR THE
DU PONT SODIUM HYDRIDE DESCALING PROCESS

FROM OUNCES TO TONS! That's the capacity range of current sodium hydride installations in mills, factories and job shops of all sizes. And with each unit, the same results—speedy, uniform descaling of many different metals at a saving in time and material. Hydride descaling leaves surfaces clean and bright . . . does not attack base metal. Yet, scale is thoroughly removed from even the most intricate part by the penetrating bath action.

FOR MORE INFORMATION about the Du Pont Sodium Hydride Descaling Process, just get in touch with our nearest district or sales office or send the coupon below to: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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OUTSTANDING ADVANTAGES OF THE SODIUM HYDRIDE PROCESS

- **HIGH-SPEED OPERATION**—Descales in shortest practicable time cycle . . . can be adapted to manual, conveyorized or continuous operation.
- **NO LOSS OF BASE METAL**—Bath action is reducing. Reaction stops when oxygen is removed from scale, eliminates pickling losses, etching and pitting.
- **ECONOMICAL TO OPERATE**—Permits savings in acid and metal . . . handles large volume of work in small space . . . is non-electrolytic.
- **HANDLES DIFFERENT METALS**—Alloy steel, stainless steel, nickel, copper, titanium and cobalt bearing alloys can be efficiently descaled—even in the same bath.
- **UNIFORM DESCALING**—On all surfaces without need for special racking procedures.
- **USES LOW-COST EQUIPMENT**—(Carbon Steel Tanks). NO HYDROGEN EMBRITTLEMENT.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Wilmington 98, Delaware

Please send me more information on the Du Pont Hydride Descaling Process: advantages, applications, equipment used. I am interested in cleaning_____products.

*Name*_____ *Position*_____

*Firm*_____

*Street and No.*_____

*City*_____ *State*_____

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Sodium hydride process for positive descaling

DU PONT Reg. U.S. Pat. Off.

150th Anniversary

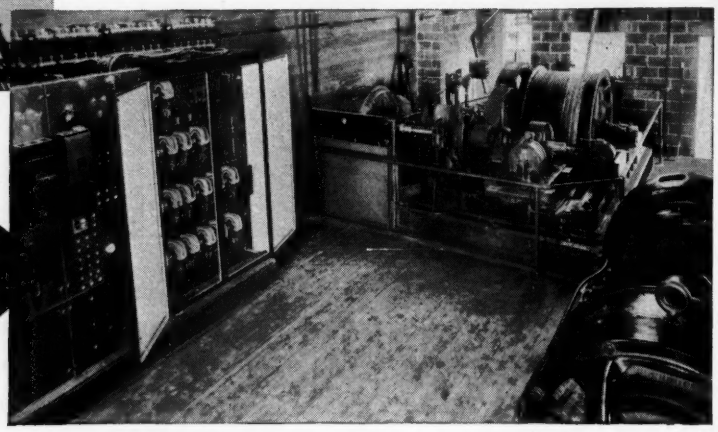
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

At the World's Largest Slag Plant—owned and operated by Birmingham Slag Company, Birmingham, Alabama.

AUTOMATIC CONTROL

Does What Human Hands Couldn't Do

Production schedule, averaging one trip per minute, now easily maintained.



New EC&M FREQUENCY RELAY Controller slows bucket by plugging to prevent overtravel and derailment of cars. Power occasionally re-applied as trip ends.

Previously, manual jogging by skilled operator could not always avert delays, even though down-car was aided by engaging counterweights to offset over-hauling effect of car going over the knuckle at the top.

THE *PROBLEM:*

How to govern speed *from the ground level* as the loaded bucket reaches the top, levels out and quickly tips to dump. The motor load, a maximum driving value on the upgrade, falls off as the bucket levels out, and changes quickly to maximum *overhauling* as the bucket jackknifes to dump. An operator has little time to "feel" or judge the motor load under such swift or sudden changes.

THE *SOLUTION:*

EC&M Frequency Relays respond accurately to the slip-frequency of the wound-rotor hoist motor. As a loaded bucket reaches the top, plugging is automatically applied by the limit switch and the bucket reaches the end of travel with motor speed reduced to 17% or less. An empty bucket going over the knuckle operates in like manner. With a *heavily loaded* bucket, power may be re-applied after plugging but the motor seldom speeds up to a point where a second "plug" is required before the trip is ended. EC&M Frequency Relays provide a simple, accurate method of controlling plugging and accelerating contactors for smooth operation of the a-c skip hoist.

Write for your copy of EC&M Frequency Relay Controller Bulletin 9302-SK.

Contacts Lasted 3 Months—
No Replacement Now in Over 2 Years

Previously, frequent jogging handling heavy currents accelerated contact wear. Since converting to automatic operation by Frequency Relays, movements are a minimum and examination after 2 years indicates no replacement will be needed for some time.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

June 2, 1952

Let's Keep on Selling!

In this election year when the New Deal presumably wishes to continue its 20-year reign ad infinitum, strange things are happening. Trumanites are trying to push business another loop higher on the inflationary spiral. This is in a period when business is still exceedingly good but undergoing much-needed readjustment and a return to competitive selling. Uptrends in business (or reasonable facsimile), not readjustments, will sell more New Deal votes in the November elections.

The pressure was on only a few months ago to increase capacity for producing basic materials and to channel a substantial portion of resulting expanded output into war goods. Even while the planners were still calling on industry to increase production, conserve materials and get out dormant scrap, finished goods were piling up. Purchasing agents meeting at Atlantic City last week had this to report:

Less buying ahead. Voluntary reduction in inventories. Shorter work week, less overtime, more layoffs. Little need for controls. An adjustment in the economy is overdue. Business will continue at a high level compared with any normal year.

These are some of the opposing current and potential inflationary factors:

Government spending is at the annual rate of $75 billion, up nearly 50 per cent from a year ago and still rising. Total U. S. expenditures in first quarter at the annual rate of $339.7 billion were $20 billion ahead of a year ago and $5 billion higher than in fourth quarter. Lifting of restrictions on installment buying may inject new life into consumer durables and edge retail sales upward. Easier credit, too, is aiding new housing starts. OPS is raising price lids on cost-of-living items—where they will be noticed quickly by the consumer. Full effects of the sixth round wage increase have not yet been felt. The cold war looks hotter.

Planning in this aura of conflicting influences is most difficult, but even so it is one of the inherent responsibilities of management. Planning right now means that you must keep on selling two things: Better government and better acceptance of the products you make. Both will be needed in the months ahead.

Irwin H. Such

EDITOR

NEW CHAPTER: A new chapter in the history of hot extrusion is written in this issue of STEEL.

The process long has been used for quickly and economically squeezing metal out into tubular and solid shapes of varying cross section

and in long lengths. One of the first applications undoubtedly was in making lead pipe. Now, it is an accepted method in the nonferrous metal industry for forming copper, aluminum, magnesium and their alloys. Repeated cold rolling and annealing are eliminated and many of the intricate shapes in common use today either could not otherwise be made at all or only at excessive cost.

At Beaver Falls, Pa., Babcock & Wilcox Tube Co. has placed in operation the first plant in the U. S. using the Ugine-Sejournet process in the production of seamless tubing and solid shapes from the more refractory stainless steels and highly alloyed and high melting point metals such as titanium, molybdenum, vanadium and zirconium.

Significantly, the process opens up a whole new field of applications for these materials, especially where higher temperatures and pressures and increased resistance to corrosion are important considerations.

* * *

CONFUSION IN COPPER: Producers and users of copper last week were wondering where they stood. Acting Defense Mobilizer John Steelmen contributed heavily to this latest difficulty in the red metal when he directed OPS to write a complex order (p.179) permitting producers of brass mill and copper wire mill products to add to their ceiling prices 80 per cent of the cost of imported copper in excess of 27½ cents a pound. The move is designed to encourage more imports of copper.

Even in OPS there were grumblings about the order, but over in NPA the distress was acute. That agency apparently had not been consulted on the matter, especially as to the effect on the domestic control system. Some NPA men privately believe the pricing order will bring chaos to copper distribution setups.

Last week industry men were invited to Washington for their opinion as to the effects and workabilities of the pricing order.

* * *

STEEL AND MOVIES: Last Monday the U. S. Supreme Court ruled unanimously that the movies are entitled to constitutional guarantees of free speech and a free press.

This was most encouraging to the sober citizens of this nation who would abide by the constitution and are standing by awaiting the Court's decision on the seizure of the steel industry.

One might arrive at the conclusion that, after all, perhaps the New Deal-appointed Court feels the proper weight of its responsibilities in upholding the constitution, that it will give full consideration to the basic issues involved in the steel case and that it will hand down a decision that already seems clear-cut to most of us.

* * *

CHANGING LABOR ATTITUDE? A careful reading and appraisal of the news reports these days would lead one to the belief that labor, like business, finds government "assistance" wearisome and futile.

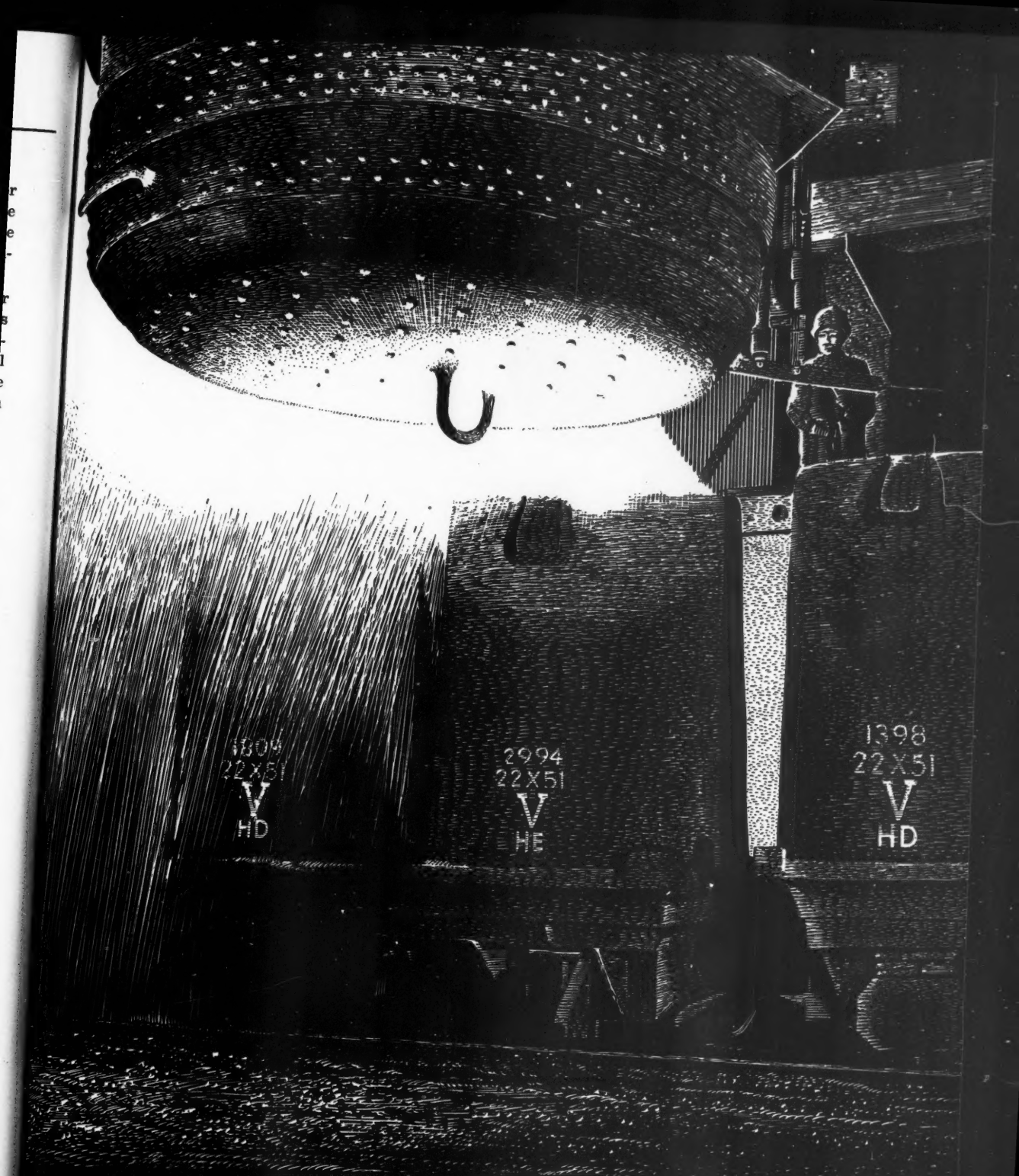
After nearly two years of government operation the railroads have been returned to their owners and the unions settled on practically the same terms proposed early in their negotiations for more money.

Higher steel wages have been prevented by court action pending decision on the steel seizure case. The Wage Stabilization Board in effect pitched the oil workers' case back to the unions and settlements have been worked out individually with all but a dozen companies.

Perhaps labor union brass is reaching the conclusion that it is better to sit down and work out wage and other common problems with management without the illusory aid of government.

* * *

TOOL STANDARDIZATION: Big step in the direction of long-needed international machine tool standardization may be taken June 11-13 when the International Organization for Standardization meets in New York. (p. 121) Representatives from 33 countries will tackle a multitude of controversial subjects including machine tool construction and operation, workholding equipment, drive mechanisms. They will be fighting an uphill fight against entrenched design ideas and an array of definitions and measurements. In that fight, may the best ideas prevail.



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INLAND

Competitive Times Here Again

The long awaited adjustments from abnormal peaks since Korea show up in the availability of goods and materials, softer prices or cautious buying

INDUSTRY IS FACING a rather sluggish summer. An adjustment from unnatural business boom will be noted increasingly through the third quarter.

The recessional trend is not alarming. Business will continue at a high level in comparison with any normal year. But easier availability of goods and materials will swing the markets from a sellers' dictation to buyers' option.

That was the consensus of metalworking executives, industrial buyers and economists attending the National Association of Purchasing Agents in Atlantic City May 25-28.

"Equilibrated" — The easing in the industrial outlook—and all emphasize it is only an easing—is coming with little distress and no panic. So far it is orderly. There are no indications of a sharp downward plunge.

Dr. Edwin G. Nourse, former chairman of the President's Council of Economic Advisers, coined "equilibrated" to describe current conditions. He believes the boom and recessional forces in the economy are fairly evenly balanced.

Overdue — Most metalworking executives believe the adjustment is long overdue. Many welcome the more competitive markets. "It can be an extremely healthful development for us and for the nation," says a die castings producer.

Here is the way the situation looks:

Output—Production is being cut to fit the demand cloth. Substantially more companies report declines than note increases. A survey by the NAPA shows 50 per cent more companies reporting declines than in May a year ago.

Backlog — New orders are well below shipments. Back orders are dwindling and account for much of the decline in production. The drop-off in new bookings is worrying capital goods producers particularly, although their backlog often extends for 12 to 18 months.

Prices — Industrial commodity prices have been weakening steadily since January, say the purchasing agents. Lower prices were reported by 25 per cent in April and by 35 per cent in May.

Many comment that more quotations below ceiling prices would be made if suppliers were assured the reduced price would not be interpreted as a new ceiling price by the Office of Price Stabilization.

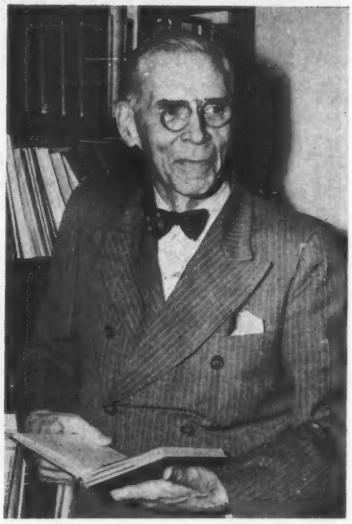
Inventories—Industrial stocks of unworked materials and finished goods in warehouses are being reduced. Fifty per cent of companies have cut inventories below the May, 1951, level.

Causes for the liquidation are increasing availability of materials and lack of confidence in the price structure.

Buying Policies — Fewer companies are buying ahead. A year ago most buyers were working towards 90-day coverage, considered then to be conservative. Today the accent is on 30 to 60-day coverage.

Payrolls—Work weeks are shorter than a year ago. Overtime, common in the months following Korea, has pretty well disappeared. Short time and layoffs are more prominent.

Noting that trend metalworking executives are amazed by the threat of workers to "hit the bricks" if their demands for higher wages are not granted.



NEA

DR. EDWIN G. NOURSE
. . . "current forces are 'equilibrated'"

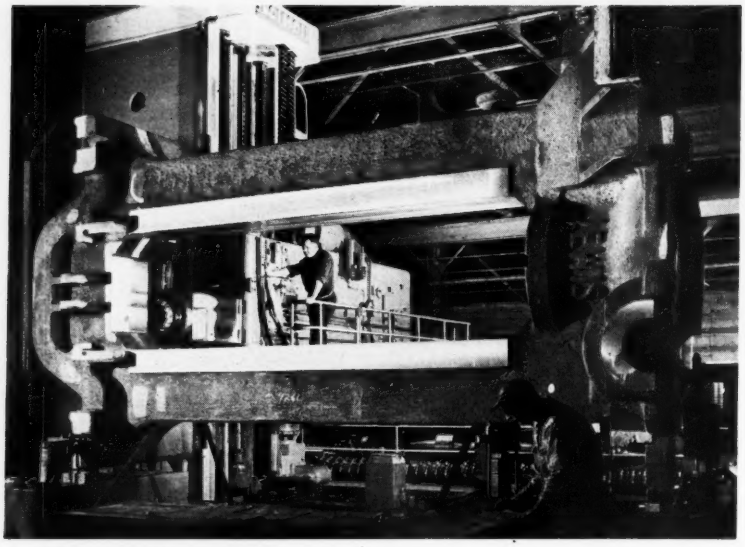
Controls—Nine out of ten purchasing agents favor elimination or modification of price and material controls. The majority believe controls have failed miserably to accomplish their purpose and that they cannot now be doctored. Says one: "The government planners are in the position of the boy who dropped his bubble gum in the chicken coop. They don't know what to do next."

Outlook—R. C. Swanton, Winchester Repeating Arms Co., division of Olin Industries, New Haven, Conn., in a survey found 42 per cent of the purchasing agents expect the down trend to continue during the third quarter. Thirty-two per cent anticipate improvement; 26 per cent see no change.

For fourth quarter the picture is somewhat brighter. Twenty-five per cent expect a continuation of the down trend; 50 per cent see no change; 25 per cent expect improvement.

Unemployment: Easing But Not Forgotten

THE KALEIDOSCOPIC employment picture now shows Detroit, Flint and Grand Rapids, Mich. removed from the Group IV substantial labor surplus category and reclassified as areas of moderate supply. Almost concomitantly, dissolution of the Defense Distressed Areas Task Force which was in some measure responsible for the employment boost through channeling defense contracts into the



A Miller Mills a Mill

This 409,000-pound milling and boring machine is part of a modernization program at Lewis Foundry & Machine Division of Blaw-Knox Co., Pittsburgh. Here it is milling a hot-rolling-mill casting. The unit is the largest of its type built by Ingersoll Milling Machine Co., Rockford, Ill., costing over $400,000

area was announced by Manly Fleischmann, defense production administrator, just before he resigned June 1. (Henry M. Fowler is new DPA chief). Although the local pump-priming function of the Task Force does not die with it but has been transferred to the 19 Regional Defense Mobilization committees, some observers are putting the two together and concluding the hardship area is a worry of the past.

You Can't Be Wrong—Whether you see a minimal or maximal unemployment situation depends in no small measure on where you are. The Labor Department survey on the subject lists 55 areas of short or balanced labor supply, 122 areas of moderate or substantial labor surplus.

The number of hardship areas has increased over last month, but the size of the idle workforce is somewhat smaller. Nonagricultural wage and salaried employment now account for 12.4 per cent of the hardship area unemployed as compared with 14.7 per cent in March.

Over-all Optimism — Employer opinion indicates higher employment levels are ahead, says the Labor Department, which points out that of 11 major areas reclassified in May, all but four were reclassified upwards.

Factors contributing toward higher employment include the normal spring pickup in employment, rising seasonal demands for farm workers, the growing manpower needs of defense employers, easing of materials supplies for civilian production and a better distribution of defense-connected job opportunities growing out of the program for giving preference in government procurement to areas with substantial labor surpluses.

Why Scrap Export?

The 17,000 tons of unstripped motor blocks recently exported were made surplus in the United States because of prevailing high wage rates for workers that prepare scrap. It would have cost too much to prepare the scrap for use in this country. Of the blocks, 10,500 tons were shipped to the United Kingdom and 6500 tons to "other destinations". Other second quarter exports included 3500 tons of copper precipitation scrap for use by American copper companies in Mexico and Chile and 26,500 tons of open-hearth grades for Mexico. Even though the scrap inventory in the country as a whole is now bigger than at any time since 1943, the Office of International Trade has denied requests for supplementary allotments of scrap iron and steel for export during the second quarter. While the second quarter amount was 46,500 tons as compared with 25,000 tons for first quarter export, it was felt that undue relaxation of curbs on exports are unwarranted because of scrap problems expected to loom again next winter.

Strike Cuts Pig Iron Output

Despite curtailment of blast furnace operations in April as a result of the workers' walkout, production of pig iron, ferromanganese and spiegelisen increased to 23,349,053 tons in the first four months of this year from 22,965,987 tons for the like period a year ago. Output declined to 5,224,854 tons in April from 6,300,006 tons in March. The second mill shutdown will be reflected in the May report.

Capacity of the industry is 1,310,560 tons larger on an annual basis than it was a year ago. This expansion includes the capacity of two additional furnaces which have been placed in operation as well as enlargement of certain other furnaces.

The relative position of the various districts remains unchanged. Of the total output of 5,185,396 tons of pig iron produced in April, the Pittsburgh - Youngstown district accounted for 1,941,864 tons; Chicago, 1,036,322 tons; eastern, 1,004,524 tons; Cleveland-Detroit, 529,181 tons; southern, 430,643 tons; and western, 242,862 tons.

Scrap Scandal in Pittsburgh

Crucible Steel Co. of America, Pittsburgh, has uncovered evidence of fraudulent practices connected with deliveries of scrap steel to its Midland, Pa. works. This information was turned over to federal authorities and charges were heard before the United States grand jury in Pittsburgh.

Falsified billings from certain

Tower Receives Gary Memorial Medal

Walter S. Tower, right, the retiring president of American Iron & Steel Institute, was awarded the Gary Memorial Medal at the dinner meeting of the institute in New York. Mr. Tower, the eleventh man to receive the medal since its establishment in 1927, was cited for outstanding achievement in the industry. He was president of AISI for 12 years and executive secretary for nearly seven more. Max D. Howell, left, vice president of U. S. Steel Corp., was elected to the new post of executive director. George Rose, center, is AISI secretary

suppliers of scrap, coupled with falsified records kept of scrap inspection and inventory within the Midland Works, has resulted in many cases in which Crucible was defrauded in the prices it paid for scrap steel.

The loss is estimated to be in excess of $300,000.

Company officials point out that the quality of its products was not in any way affected, the fraud having been entirely a "paperwork" proposition.

New Ore Deposit To Be Tapped

A new iron ore deposit on Vancouver Island with an expected yield of 2 million tons of magnetite is to be opened soon. A mill will be built by the Argonaut Construction Co., of San Francisco, about seven miles from the workings on Quinsam lake.

The ore body is being opened because the company has a Japanese market for the remaining ore on the Quinsam lake property. Vancouver ore is now being shipped regularly to Japan, where some of it is returned to Canada as steel for construction and shipping.

More Steel for You

Capacity to finish some products will be up 7 to 29 per cent by next Jan. 1

YOU'VE BEEN hearing a lot about the expansion of the steel industry's ingot capacity. But what does it mean in terms of finished steel for your plant?

For an answer look at some figures put together by Allegheny Ludlum Steel Corp. Chairman Hiland G. Batcheller with the co-operation of the American Iron & Steel Institute.

The figures give the picture for next Jan. 1.

Capacity to produce **hot-rolled sheets** will be 28,795,770 net tons, an increase of 6,466,720 tons or 29 per cent over Jan. 1, 1951.

Hot-rolled strip capacity will be 7,306,670 tons. That's a rise of 665,100 tons or 10 per cent over Jan. 1, 1951.

Cold-rolled sheet capacity will total 14,464,210 tons, a rise of 2,983,880 tons or 26 per cent over Jan. 1, 1951.

Cold-rolled strip will be 2,737,750 tons, up 189,050 tons or 7.4 per cent over Jan. 1, 1951.

Electrolytic tin capacity will be 3,861,610 tons. This is a rise of 753,040 tons or 24.2 per cent over Jan. 1, 1951.

These increases are all in the light flat-rolled category. What about bars, now the most critically short of all finished steel products? Capacity to produce **bars** (not including concrete reinforcement bars) will be 13,680,790 tons, an increase of 2,244,860 tons or 19.6 per cent over Jan. 1, 1951.

Larger Steel Demand in West

The West has a long way to go to catch up with the rest of the country in consumption of steel.

According to Jack L. Ashby, vice president and general manager of Kaiser Steel Corp., in 1951 the nation as a whole consumed 1365 pounds of steel per person, while in the seven western states each person consumed only 718 pounds of steel. Mr. Ashby expressed confidence that the western steel market will continue to grow. In 1940 the total steel consumed in the seven western states was 2.5 million tons, and the production in the West was 700,000 tons. Approximately 1.8 million tons of steel were shipped in from other sections of the country.

According to the Kaiser executive, deficiency between supply and demand in the West has not been overcome by the new steel facilities built in the West during the last 10 years. The gap between western demand and local supply in 1951 was even greater than in 1940. Last year, said Mr. Ashby, the seven western states produced approximately 3.6 million tons of finished steel products and consumed 6 million tons. It was necessary to ship approximately 2.4 million tons of steel from east of the Rocky Mountains.

GSA Starts New TV Lab

Construction of a new $3 million laboratory for General Services Administration is about to start at Boulder, Colo. Its staff of 500 research workers will be concerned with radio and television problems, particularly in the higher frequency ranges now under development.

Refractories: Eye on Steel

Producers with expired labor contracts are sweating out the steel settlement

REFRACTORY manufacturers are producing on borrowed time.

Many of their labor contracts, including ones with the United Steelworkers, have expired, but they're still operating, pending a decision in steel. The economic question snagging settlements with refractory workers parallels the steel wage-price problem.

Price Ceilings—The Refractory Industry Advisory Committee has already told NPA that refractory production will be seriously curtailed unless the Office of Price Stabilization lifts the present price restrictions when bargaining time finally does come.

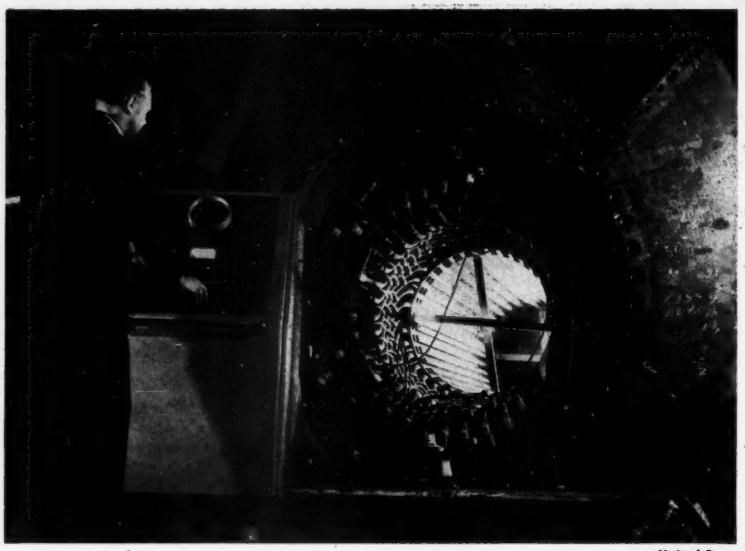
Last price increase for the industry came in the last quarter, 1950. In the case of insulating fire brick, for example, the last advance was in July, 1950.

Good Supply—In the meantime, production exceeds demand in refractories in almost all cases. Exceptions: Insulating fire brick, coke oven silica shapes and silicon carbide abrasive brick.

Recent expansion in refractory production facilities results in the direct reversal of the supply picture from a year ago. Latest government figures show the industry has certificates of necessity for fast write-offs covering an expansion of 35 to 40 per cent of its 1948 capacity. That expansion, which represents about $60 million, followed a request from NPA to increase refractories production to keep pace with the expansion in steel plant and allied activities. Expansion in refractories has exceeded that in steel and should be nearly complete by the end of 1952.

No Spurt—Effects of damage incurred in the two steel shutdowns was minimal for refractory producers. Some report rush calls for brick used in ladles, both orthodox open-hearth and the Pugh or Treadwell types (torpedo or cigar-shaped car-mounted ladles). In the past deliveries on refractories have been so erratic that users began stockpiling abnormal inventories. Now, users are drawing from these inventories and these stocks have acted as cushions in the strike emergencies.

Incoming orders now represent only about 40 per cent of refractory production capacity; backlog of orders, which has permitted manufacturers to operate at approximately 80 per cent of capacity, is now falling rapidly. Demand is still good from foundries, steel casting shops, expanding armor plate producers and power and glass producers. But, the biggest customer—steel—apparently is leveling off its expansion programs. Refractories will follow suit.



United Press

Physical Exam, Westinghouse Version

Just as your physician gives you a physical examination, so this "dynamo doctor" probes the physical properties of a power generator. Developed at Westinghouse Electric Corp., the surge comparison tester at left checks the insulation arteries of a generator by means of a cathode-ray oscilloscope. The device can test anything from aircraft generators to giant dynamos like this one

Goss Casting Process Licensed

Exclusive license for casting aluminum and other nonferrous metals continuously under the Goss patents has been acquired by the Apex Metal Products Corp., Cleveland, a subsidiary of Apex Smelting Co., Chicago.

The Goss process of continuous casting represents the most direct route from molten metal to the forge hammer or the screw machine. Molten metal is cast directly into bar or billet form or any other convenient shape suitable for machining or for further reduction under the forging hammer.

At present a pilot plant is being operated by the company for the production of test bars; within a few months the company expects to engage in full scale operation with a commercial unit.

Equipment: Power Goal Problem

Increased facilities for electric power equipment producers will be required if the goal of 107 million kilowatts output set for December 31, 1954, is to be reached. Reason: The yearly increment is far in advance of normal power facilities expansion and manufacturers can't handle the increase without expanding their own facilities.

In reaching the goal, equipment with the following annual capacities will be required: Power and distribution transformers, 88.5 million kilovolt amperes; water wheel driven generators, 3 million kilowatts; hydraulic turbines, 4 million horsepower; condensers, 13 million square feet condensing surface; steam boilers, 280 million pounds steam per hour; and steam turbines with 15.5 million kilowatts output.

Busy Signal For Telephone Equipment

Rural telephone service expansion and long-distance dialing equipment offer a solid future to equipment makers. Present order backlogs are heavy.

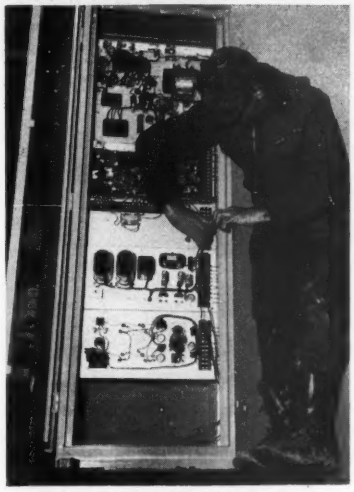
TELEPHONE EQUIPMENT makers, already swamped with civilian and defense orders, see their future resting on a secure cushion of long-distance dial equipment and farm service expansion sponsored by Rural Telephone Administration.

One of the handful of major suppliers, Western Electric Co., registered gross sales up 30 per cent over 1950 last year and the firm expects to better the figure this year. The estimated 200 suppliers for the firm are going great guns, too. Delivery on some major items runs nine months to a year, and, barring a shift in the Chilean situation, copper shortages are not expected to hamper production.

Behind the Switchboard—Equipment makers are in the middle on an argument over their output. The Rural Electrification Administration was granted authority by Congress to make loans to new or existing co-operatives or companies for rural telephone service expansion and improvement through a new division, the Rural Telephone Administration. There was little or no disagreement on the fact that rural telephone facilities needed improvement. There are actually fewer phones on farms today than there were in 1920.

But what makes the small independent telephone companies yelp is the "profit-tax-exempt" competition they see staring them in the face. Regulations prohibit independents from making enough money to expand their facilities into quasi-lucrative areas. Now the same government that made the regulations is going to cure the problem its regulations have created, they say. Major telephone firms see a dangerous tendency in the "subsidization" (government lending rate is only 2 per cent), and find their orders competing in equipment suppliers' backlogs with the RTA-sponsored jobs.

Mollified?—It is believed now, however, that few new telephone companies will come into being,



REA RADIO-TELEPHONE LINK
. . . a new item for busy plants

but rather that existing firms will take the loans. The bigger firms are looking at rural service as sour grapes anyway.

RTA, Going to Town — As of May 16, 1952, a total of $66 million had been allocated for loans to 102 commercial companies and 68 co-operatives in 38 states. The loans will enable the borrowers to construct or rebuild 57,167 miles of pole line to serve 119,986 new subscribers and provide improved service to 95,951 present subscribers. About 50 per cent of farms have phones now.

With the large amounts of wire and equipment necessary, the program should help hold the telephone equipment production levels at peak for some time to come.

Long Distance, Too—The second factor in the mellow long-range outlook is long-distance dialing equipment . . . complicated and costly. Not only must the dialing equipment be replaced to cope with an increased number of digits, but metering equipment to record the distance and time for billing the customer must be installed.

And to equipment makers, that busy signal sounds good.

Small Firms Get RFC Loans

Nine small business firms were granted loans totaling $1,062,500 by the Reconstruction Finance Corp. on recommendation of Small Defense Plants Administration.

These loans bring the total of such loans made to small concerns by the RFC on recommendation of SDPA to 64, with a total value of $6,971,690. Since Dec. 26, 1951, SDPA has received more than 600 applications, of which 77 were denied and 66 withdrawn.

Small business loans, as provided by Section 714 of the Defense Production Act, are made by RFC upon recommendation of SDPA in cases where private financing is not available. In some cases private banks participate by taking a portion of the loan.

Latest companies to receive loans, subject to final adjustment by RFC are: Mosow Screw Machine Co., North Chicago, Ill., Apalachicola Mfg. Co., Apalachicola, Fla., Tennessee Aircraft Inc., Nashville, Sewles Milling Co., Jonesboro, Ark., Laridon Hosiery Mills, Greenville, Mich., Tool Design & Engineering Co., Culvert City, Calif., Medley Mfg. Co., Columbus, Ga., Northwestern Marble Corp., Minneapolis, and Nordhausen Co., San Francisco.

Small Arms Makers Complain

Manufacturers of small arms for civilian use charge that government controls hurt their business, especially export sales.

About 50 per cent of the industry's production of side arms (pistols and revolvers) of .22 to .50 calibre are made for export, while about 10 to 12 per cent of shoulder arms (rifles and shotguns) go abroad. About 85 per cent of the small arms industry's output goes into protective work such as the training and arming of the military services, police and governmental investigating agencies, farm-ranch vermin and pest control and for order of foreign governments. The remaining 15 per cent goes for sporting purposes.

The 45-day inventory restriction on steel is impractical for the industry, claim manufacturers, because it normally operates on a six-month delivery schedule.

The Tanks Are Rolling

Twenty-ton tank hulls are handled with comparative ease by the barrel-shaped welding positioners at the left of the main assembly line of the Continental Foundry & Machine Co., East Chicago, Ind. The positioners rotate the hull to make welding operations easier. Equipment on the right of the aisle pre-machines the front section armor casting in preparation for installation on the hull

Defense Pools: Far from Overflowing

Up to now pooling organizations have not been able to demonstrate their production abilities, mostly because procurement officers hesitate to give them defense orders

DEFENSE PRODUCTION pools could be turning out a lot more work than they are. But they're having trouble getting defense contracts on their order books.

To date, 375 companies, representing 15,607 workers, have voluntarily grouped together into 14 production pools for the purpose of making defense equipment and materials. During World War II about 2000 small firms organized into 250 pools and obtained more than $600 million in war contracts. The majority of defense pools in the present emergency have been organized too recently (nine of them since October, 1951, when SDPA was established) to ascertain their real worth. But it seems unlikely now that defense pools will do anywhere near the proportionate volume of military business they did in World War II.

Ideal Operation—Theory of the pools is that they prevent small business from being lost during a mobilization period. Small plants, which could not attempt many types of defense contracts on their own because of their limited facilities, can take on prime and subcontracts for involved items by banding together with other concerns offering complementary services.

Why aren't these pools getting more defense contracts in the present emergency? Sen. John J. Sparkman (Dem., Ala.), chairman of the Senate Small Business Committee, says: ". . . our committee investigation found that procurement officers do not like to deal with pools and in certain cases have been discriminating against them." Procurement officers are making awards strictly on the basis of the lowest bid, sometimes without giving the pools a chance to negotiate on a bid when everything except price is in their favor. Also mitigating against more orders for defense pools is bulk of "off-the-shelf" items which are being ordered—items which have been tooled up and in production for some time.

Unprofitable Operation—Finally, some pools themselves are not actively soliciting defense work because involved paperwork and the sharp eyes of procurement officers for strictly low-price bids have put a lot of work into simply making a bid and taken a lot of profit out of getting an award.

Net effect? Small business' share of defense contracts has been going steadily downward since Korea, says Senator Sparkman. Small companies participation in defense contracts decreased from 24.5 per cent of the dollar volume in the year ending June 30, 1950, to 17.6 per cent during the eight months starting July 1, 1951.

SDPA Hurrah—Some pool executives, like the Peoria Consolidated Manufacturers Inc.'s executive vice president, Warren J. Smith, say ". . . we have positive proof that the Small Defense Plants Administration will be the salvation of small business in this defense emergency."

SDPA functions in three spheres for defense production pools: 1. SDPA specialists survey pools for

SELECTED DEFENSE CONTRACT AWARDS VALUED IN EXCESS OF $150,000

PRODUCT	CONTRACTOR
Crimping Machines for Ammunition	Canister Co. Inc., Phillipsburg, N. J.
Guns, Automatic, 20 mm	Buffalo Arms Inc., Buffalo
Gun Parts, 20 mm	Crown Cork & Seal Co., Baltimore
Howitzers, 105 mm	Chain Belt Co., Milwaukee
Bolt Assemblies	United Automotive Engineering Co., New York
Cylinder Gas Assemblies	Tool & Metal Specialties Mfg. Co., New York
Primers, Percussion	National Sewing Machine Co., Belvidere, Ill.
Cartridge Clips	Borg-Warner Corp., Chicago
Cannisters, Smoke	John E. Mitchell Co., Dallas, Tex.
Metal Parts for Shells	G. M. Mfg. Co. Inc., Long Island City, N. Y.
Crane Trucks	Bay City Shovels Inc., Bay City, Mich.
Automotive Parts (3 Contracts)	Caterpillar Tractor Co., Peoria, Ill.
Automotive Parts	Hercules Motors Corp., Canton, O.
Radio Sets	Sentinel Radio Corp., Evanston, Ill.
Radio Terminal Sets	Transmitter Equipment Mfg. Co. Inc., Hudson City, N. Y.
Open Lighters	Nashville Bridge Co., Nashville, Tenn.
Lockers	W. R. Ames Co. Inc., San Francisco
Oscillators for Aircraft	Super Electric Products Corp., Jersey City, N. J.
Coolers	Sunroc Co., Glen Riddle, Pa.

what defense items they can produce and lists them categorically for each pool. 2. SDPA surveys proposed defense contracts and recommends those which can be profitably handled by small business. 3. SDPA can certify the competency of a pool in regard to credit and capacity for a specific contract.

Proven Operation—With a little government co-operation and some scratching by pool executives themselves, defense production pools can still make a big contribution to the mobilization effort. Pools like Omaha Industries Inc., with $1 million in subcontracts completed and over $1 million more on the books, and Peoria Consolidated Manufacturers Inc., with a $3 million Navy contract in the final stage of negotiation prove that.

More Defense Plants Approved

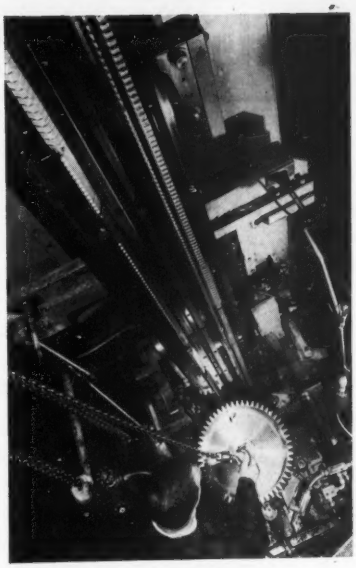
Volume of construction being certified by Defense Production Administration for accelerated tax amortization continues heavy. From May 2 through May 15 certificates of necessity amounted to $479,121,881 for 470 new or expanded defense facilities.

The two largest certificates covered $30 million electric power projects, one to Philadelphia Electric Co., Cromby, Pa., and the other to California-Oregon Power Co., Douglas county, Oregon. The third largest was issued to Pennsylvania Railroad for $29,390,000.

Accumulated certifications issued to May 15 total $19,175,194,088, covering 10,300 new or expanded facilities.

The latest geographical analysis of applications approved for rapid tax write-off shows that Ohio industries received more than any other state. Cincinnati, Akron and Cleveland were rated in that order among the cities receiving certificates in Ohio. California received the second largest number of certificates while Pennsylvania was third.

On a sectional basis, the east-north-central states led the country, both in the number of certificates and in the dollar volume of proposed investment. Second highest were the mid-Atlantic states.



Broaching the Disc

This 14-foot-high broaching machine, one of thousands of machine tools developed to speed jet engine production, cuts triangular slots into the tough alloy-steel turbine disc of a Turbo-Wasp jet engine at Pratt & Whitney Aircraft Division of United Aircraft Corp., East Hartford, Conn. The in-line cluster of broaches makes the cut in the disc with a single stroke

CHECKLIST ON CONTROLS

Price Regulation

ESSENTIAL COMMODITIES, SERVICES—General Overriding Regulation 29 permits individual manufacturers of essential products and services to apply for increases in ceiling prices on individual commodities produced at a loss. OPS may increase by special order the ceiling prices of resellers of commodities or services on which higher ceilings are authorized. Price relief will be granted to cover the total operating cost of a particular commodity produced at a loss even if the firms current rate of return on net worth on its over-all operations equals or exceeds 85 per cent of its average rate of return for its three most profitable years from 1946 to 1949. If current rate of return is less than 85 per cent of the average rate during the four-year base period, a firm may be granted an increase in excess of the total unit cost of producing an individual commodity. A firm may elect to receive an average percentage adjustment for all commodities in a product line to prevent distorted price relationship betwen various commodities of the product line.

Appointments in Washington

George E. Merryweather, on leave from Motch & Merryweather Co., Cleveland, was appointed assistant to director, Metalworking Equipment Division, National Production Authority.

Drexel A. Sprecher, formerly acting chief counsel for the Salary Stabilization Board, Economic Stabilization Agency, was named assistant administrator, Small Defense Plants Administration.

Edwin Jason Dryer, formerly manager of the Bonneville Power Administration, was appointed Deputy Administrator, Defense Electric Power Administration, Electric Power Administration.

Norwood B. Melcher was appointed chief, Ferrous Metals & Alloys Branch, Minerals Division, Bureau of Mines.

Jacob Schroeder was appointed chief, Mechanisms Branch, Electrical Evaluation Division, Naval Ordnance Laboratory, White Oak, Md.

Col. Aldo H. Bagnule was appointed district engineer at St. Paul, Army Engineer Corps.

SDPA Fights for Expansion

Defense Production Administration and Small Defense Plants Administration are getting together to assure small business firms equitable participation in the nation's industrial expansion program now being encouraged by accelerated tax write-offs.

Under the agreement, DPA will continue to press for needed expansion, but a definite small business share of each expansion goal will be established, thus setting a target for small business to meet in order to maintain its pre-Korean position in the industry being expanded. DPA has agreed to hold open the small business share of each program for 30 days to give small business a chance to take part. SDPA's job will be to notify small firms of the opportunity.

Will Produce Metals for AEC

Carborundum Metals Co. Inc., a new subsidiary of Carborundum Co., Niagara Falls, N. Y., has signed a contract with the Atomic Energy Commission for the production of zirconium and hafnium sponge metal. The contract provides for the sale, at a unit price of less than $15 per pound, approximately 150,000 pounds of zirconium and hafnium per year for five years.

Both metals are produced from zircon sand obtained from the beaches of Florida. Zirconium is used in the construction of nuclear reactors because of its corrosive resistance, ductility, strength and its low rate of neutron absorption.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Unpretentious standardization of specs in gasoline engines is a monumental achievement for the Munitions Board. Now the ice is broken; industrymen hope for rapid de-redtaping

THE MUNITIONS BOARD'S first major standardization program — in gasoline engines in bore size from 3 to 4 inches inclusive—will be effective July 1. On that date the Army Engineers Corps will issue a revision of the specification MIL-E-11275(CE), making only standardized 3 to 4-inch engines available for military procurement. From then on a host of powered vehicles and all machinery driven by those engine sizes will have to be equipped with engines on the new Qualified Products List.

The move represents successful conclusion of a monumental job that has taken several years to accomplish. (See STEEL, Apr. 7, p. 88.) The Munitions Board, with the co-operation of the industry, replaced 1187 commercial parts with 59 standardized parts. Parts of all the co-operating manufacturers are interchangeable. This will mean big savings in procurement, and a great simplification in the armed services supply and maintenance problems.

Accolade — Thomas D. Jolly, former president of American Standards Association (and a vice president of Alcoa), calls adoption of industry standards by the government the most important step it has taken in standards work.

Parts made interchangeable in the engine program are the fast-wearing, high-mortality parts, such as valves, pistons and bearings. A notable feature of the standardization job is that it can be adopted on the basis of existing shop equipment.

Virtually no new machine tools will be needed.

Now the program is to be expanded to bring about similar standardization in diesel engines and in gasoline engines in bore sizes below 3-inch and above 4-inch. In addition, a start is being made on standardizing engine accessories; as an example it already is contemplated that the number of sizes of air cleaners will be reduced from the 800 now in use to only six.

Overtures — Recently manufacturers of refrigeration equipment, abrasive wheels, and rivets have approached the Munitions Board for similar standardization of their products. Unfortunately, the Munitions Board must walk softly in the matter of close co-operation with technical societies and industry. Rear Adm. J. W. Fowler, director of Supply Management Agencies of MB, says everything possible is being done to bring about closer liaison.

Specifications just have been set up for seven grease guns that meet all military lubrication needs. A complete code of electronic symbols is established. Standardization work is going forward on materials handling equipment, batteries, battery charges, and a similar program is in store for tires. Munitions Board just reduced the number of service screw drivers from 720 to 207—and this is only the first round.

Many other industries can gain in efficiency from standardization and interchangeability. They can get such action by contacting the Munitions Board's Standards Agency, Barton Hall, Washington.

Bureaucrats Define "Free" . . .

Washington is laughing over the dissent just turned in by Commissioner Lowell B. Mason over the action of his four fellow commissioners in ordering the Book-of-the-Month Club Inc. to cease and desist from using the word "free" in offering book dividends. Mr. Mason, who for years has conducted a one-man fight against stuffed-shirt bureaucracy, said:

"This is a case about a company that gives its customers one book for every two they buy; for every two books you buy you get one free. Things went along fine for many years and the consumers were getting good literature, along with a not unreasonable amount of tripe, cheap. Then something happened; just what, nobody knows. There were rumblings around the Federal Trade Commission that all was not well with the word 'free.' It played on the credulities of the American people. People bought things to get something else free—a dangerous tendency liable to stimulate trade, palliate unemployment, and eradicate bankruptcy in the book business. The answer to all this well-being, of course, was for bureaucracy to promulgate an interpretation. So the Federal Trade Commission issued its statement of policy of the word 'free.' . . . Before this, the millions of people who dealt with defendant knew what 'free' meant, but after the FTC explanation no one has any moral certainty as to how free is 'free'."

THE WORD "FREE"
. . . FTC's chaotic clarification

George J. Burger, vice president, National Federation of Independent Business, thinks Mr. Mason is undermining respect for laws and has asked President Truman to fire him. But Mr. Mason has many influential friends in Congress and elsewhere in Washington, and the FTC too many critics, to invite opening up a situation that could prove very embarrassing to the administration.

A Case in Point...

The modern rolling mill is a succession of related mechanical operations. The over-all efficiency of the mill is determined by the efficiency of each mechanical unit . . . and how well it is related to previous and subsequent operations.

The record tonnages being achieved on Morgan mills and the continued world-wide demand for them is proof of their success. Nevertheless our engineers continue to develop and put into operation new ideas and improvements. A case in point is the Rotary Disc Shears described below.

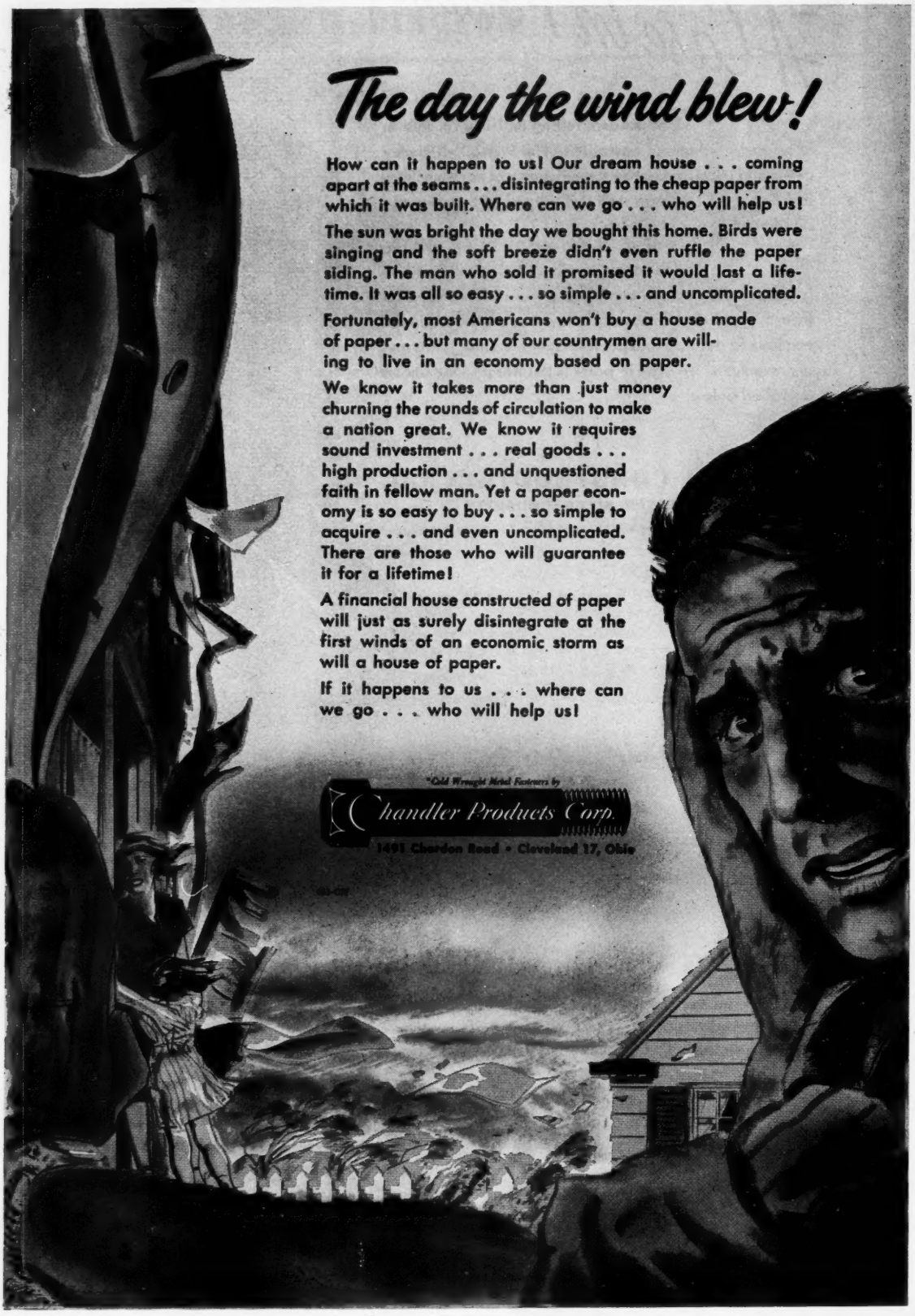
MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

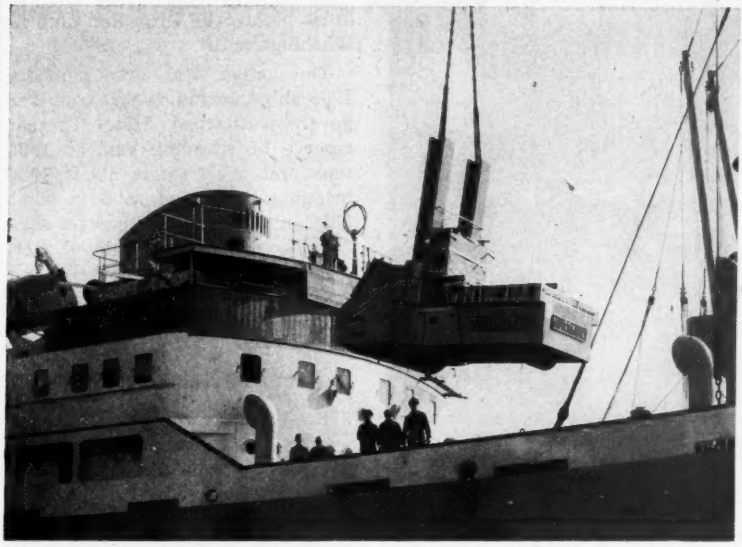
English Rep., International Construction Co., 56 Kingsway, London, W. C. 2, England

RM-46

ROTARY DISC SHEARS . . . These shears have the capacity to cut bars up to 1¾" diameter at speeds up to 3000 f.p.m. The opening and closing of the knives is performed hydraulically, dispensing with the use of magnetic clutches and brakes thereby eliminating all "creep" and making the action positive and precise. The Vee-shape cutting edge of the knives leaves no "beard" or slivers where the cut is made. Here we show twin shears for double strand rolling.

MORGAN
WORCESTER
ROLLING MILLS - MORGOIL BEARINGS
WIRE MILLS - GAS PRODUCERS - AIR EJECTORS
REGENERATIVE FURNACE CONTROL


The day the wind blew!
How can it happen to us! Our dream house . . . coming apart at the seams . . . disintegrating to the cheap paper from which it was built. Where can we go . . . who will help us!
The sun was bright the day we bought this home. Birds were singing and the soft breeze didn't even ruffle the paper siding. The man who sold it promised it would last a lifetime. It was all so easy . . . so simple . . . and uncomplicated.
Fortunately, most Americans won't buy a house made of paper . . . but many of our countrymen are willing to live in an economy based on paper.
We know it takes more than just money churning the rounds of circulation to make a nation great. We know it requires sound investment . . . real goods . . . high production . . . and unquestioned faith in fellow man. Yet a paper economy is so easy to buy . . . so simple to acquire . . . and even uncomplicated. There are those who will guarantee it for a lifetime!
A financial house constructed of paper will just as surely disintegrate at the first winds of an economic storm as will a house of paper.
If it happens to us . . . where can we go . . . who will help us!
*Cold Wrought Metal Fasteners by
Chandler Products Corp.
1491 Chardon Road • Cleveland 17, Ohio



Haul Away for France

This 50,000-pound Skylift Giant, made by the Automatic Transportation Co., Chicago, is swung aboard at Milwaukee for the journey via the Great Lakes to Rouen, France. The electric-powered truck, one of seven to be shipped, can handle coils of steel weighing as much as 40 tons. It will make the crossing on the Oranje Line's *Prins Willem V*. Destination is Sollac, the French steelmaking firm

British Wage Demands Inopportune

Demands for wage increases by several large segments of British labor come at a time when Britain is struggling to keep pace with foreign competition for export markets

WAGE DEMANDS by British labor threaten to scuttle England's chances in foreign export markets.

Currently more than 6 million workers in England have come forward with wage demands, and union leaders, representing 4 million more, are in conference figuring out how much to increase their demands. The large Amalgamated Engineering Union has asked a bigger-than-ever $6 a week hike for all members, skilled and unskilled. Farm employees are asking for an additional $4.50 which would give them a total of $20 a week. Railmen, who got an 8 per cent raise last year, are demanding another 10 per cent increase. Bus and road haulage operators have made demands, and it's likely miners and dock workers will present demands shortly.

Darkening the Outlook—All that is happening at a time when Britain is struggling to keep up with foreign competition for export markets. German and Japanese exporters, principally, are able to give immediate or near delivery, extend practically unlimited credit and wine and dine prospective customers in regal style. Britons are at liberty to offer none of that. If the British prices rise, their exports could easily be driven out of the picture.

Chancellor of the Exchequer Richard A. Butler has appealed to the trade unions to temper their wage demands in the national interest. One big reason they won't: Index of weekly wages rose from 111 in October, 1950 to 128 in March, 1952—a rise of 17 points. Retail price index jumped from 114 to 1950 to 135 in March, 1952—up 21 points.

Italians Barred from U.K. Mines

Italian coal miners, imported into England at the expense of the British government, now have been given two choices: Find other employment in England or return to Italy at government expense.

Reason they can't mine coal: Opposition by Yorkshire mining locals and threats of a nationwide coal strike have forced their withdrawal from British mines.

There are about 697,000 British miners now, compared with 688,600 a year ago. In 1951, coal production amounted to 222,200,000 tons, and 207,900,000 tons of that was consumed at home, leaving comparatively little tonnage for what is normally one of Britain's biggest money exports.

Germany Looks for Scrap

Western Germany has just been accepted as a member of the International Office of Waste Dealers, which is concerned with international co-operation in the collection and distribution of iron and steel scrap and nonferrous metals.

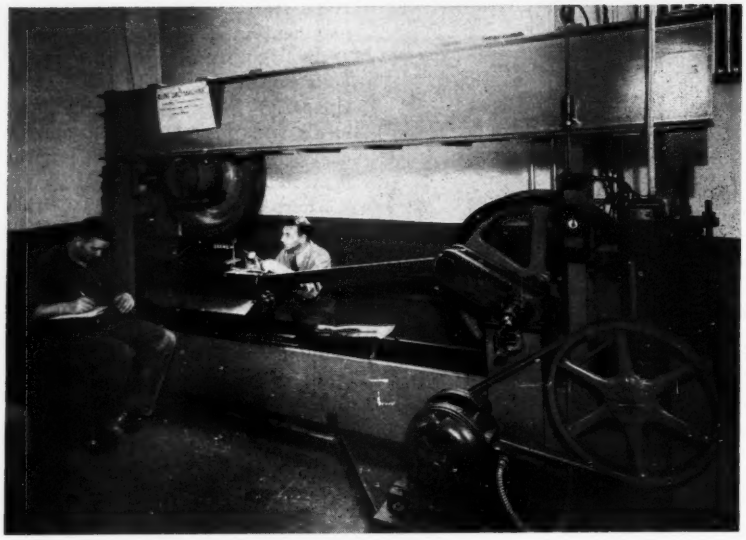
Germans expect a general change of trend on international scrap iron markets, due mainly to expected American scrap exports again. Germany hopes to resume its pre-World War II position as a scrap importer. Her scrap iron export contract with Britain will expire by mid-1952, and scrap exports will be reduced to 25,000 tons monthly for the second half of the year.

German raw steel production, which is hovering around an annual production rate of 16.5 million to 17 million tons, shows the following monthly totals thus far this year: January, 1,348,061 tons; February, 1,320,000 tons; March, 1,449,552 tons; April, 1,333,160 tons.

Copper Exports Licensed

Commercial exports of 3,452,000 pounds of copper and copper base alloy products have been licensed against third-quarter export quotas, announced the Office of International Trade. These include 1,210,000 pounds of brass mill products, 2,167,000 pounds of wire mill products and 75,000 pounds of foundry and other CMP copper products.

Still left to be committed are 1,278,000 pounds of CMP copper products against the 4,730,000 pounds set aside for regular commercial exports.



Research Reveals Rails' Resistance

The machine above is testing new types of railroad rails at the University of Illinois. Prof. Ralph E. Cramer, experimenting with manganese-chrome-vanadium alloy and heat-treated standard carbon steels, has found that rails made of either material stand up under load tests 10 times as long as ordinary rails

U.S. Iron Powder Makers Contest Swedish Domination

SWEDEN'S DOMINATION of the U. S. iron powder market is being contested strongly by domestic suppliers who've added capacity and found they can't sell all they produce.

Unless production of appliances, autos and other civilian goods using powder metal parts and bearings takes a turn for the better, competition will be keener yet. Military applications haven't yet made up for the loss of civilian business.

Foreign iron powder shipments top domestic by about 3 to 1 today. U. S. producers want to whittle that ratio down a bit. Some in the trade even think enough materials could be provided at home to meet all demands.

From Whence—Of the 20 suppliers of metal powders (including nonferrous) in business today, 15 are in this country and Canada. The other five are spread out in Sweden, England and Germany. Lion's share of the U. S. market goes to a Swedish company.

Contrary to popular opinion, Swedish powder is not of a higher grade than produced here. Because domestic producers can't hope to compete pricewise with the Swedes (labor costs are one big handicap), they've concentrated on developing higher purity and higher grade powders. Most fabricators blend the two to obtain required properties in the finished parts.

Cutting Costs — To pull their prices down to a more acceptable level, domestic iron powder producers have studied their refining methods and struck a bonanza of new techniques. A short time ago only two processes were considered—iron oxide reduction from mill scale and electrolytic deposition. This number has increased rapidly, so that today nearly an even dozen are employed.

Included are techniques to make powder directly from ore, from concentrates, from by-products sintered, by eddymills and by melting and decimating. The latter process involves at least four different types of decimating media.

Merchant Marine Tagged Vital

The security and well-being of the nation depend directly upon a strong and stable merchant marine, declared Secretary of Commerce Charles Sawyer in an address before the Propeller Club in Washington.

The active fleet now numbers 1900 ships, including 600 from the government-owned fleet. Present reserve of seagoing vessels, 1000 tons and over, totals about 1450 bringing the grand total to some 3350 ships. Secretary Sawyer said, "Our active, privately-owned merchant fleet is middle-aged, and our reserve fleet is slow, vulnerable and obsolescent."

T-2 Tankers Need More Plates

Steel plate, already in critical supply, will be even more so if the current T-2 tanker strengthening program is to be carried out. Shipyards have the capacity for about 50 vessels a month, the Ship Repairs and Conversion Ocean Going Industry Advisory Committee told National Production Authority, but they are unable to place sufficient third quarter allotments for steel.

The yards need about 5000 tons of steel, principally plates, and about 500 to 600 tons of rivets monthly. Straps, heavy internal girders or doubling plates are used to strengthen longitudinal members of a ship's hull. Between 300 and 350 T-2 tankers, most of which are between seven and nine years old, are in need of such repairs.

NPA advised the committee to use narrower and thicker widths of plate which can be rolled by strip and universal-type steel mills whenever such use is in conformity with American Bureau of Shipping specifications.

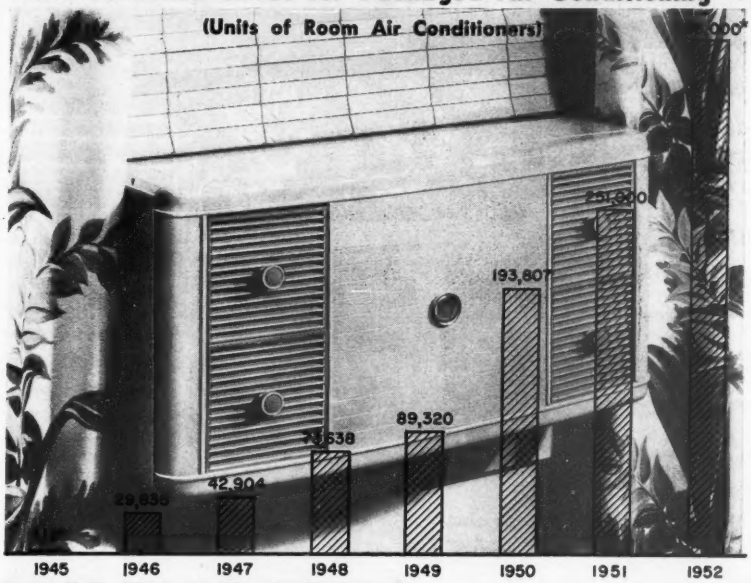
Erie's Conversion Nears End

With the announced scrapping of 26 more steam locomotives, the Erie Railroad is nearing the completion of its program of conversion to diesel power. Only 70 coal burners remain out of 760 in service in 1944, and 34 of those are slated for the scrap pile in 1953.

The 26 locomotives were sold to Jones & Laughlin Steel Corp. at scrap rates. Most of the scrap will be used at the J & L Cleveland plant.

Erie's conversion program has cost the company $73 million so far with about $6.5 million required to complete the job.

Sales Potential Great for Packaged Air Conditioning



Source: Air Conditioning & Refrigerating Machinery Ass'n.
* STEEL's estimate

Air Conditioners: Hot Future for Cool Air

Relative newcomer among consumer goods, the room air conditioner, shows promise of being the hottest selling item in the next five years

SMALL, PACKAGED air conditioners are ready to leave the special engineering field and enter the mass market. That their sales potential is the greatest of all consumer durables is the strong conviction of the 18 or more firms composing the home and office air conditioning equipment industry.

Certainly it is one of the most rapidly growing consumer goods lines. In 1940 the window sill-type room conditioner first made its appearance in quantity as an offshoot of the other primary room conditioner style, the floor model or console. From shipments of 11,444 units for room conditioners in 1940 to shipments of 251,000 units in 1951, growth in the industry was almost continuous except for the war years (see the table).

Small But Powerful—The window model room air conditioner covers a range of ⅓ to 1½ horsepower, is an air-coolant unit. The console ranges usually from 1½ to 2 horsepower and requires water. Other residential units, ranging from 1 to 5 horsepower, can be installed as independent systems or linked up with ducts of any forced warm air heating system.

Improvements in design, production and distribution have enabled producers to market conditioners of increasing efficiency. This means smaller packages with decreasing price tags despite rising costs. According to the Air Conditioning & Refrigerating Machinery Association, Washington, the 42,904 units shipped in 1947 at an average retail price of $350 developed a dollar volume of $15,016,400. In 1951 the 251,000 units sold at an average retail price of $310 developed a dollar volume of $77,810,000. With controlled materials easing considerably in supply, 1952 is expected to be another better-than-ever year for sales.

Poser for Producers — Overcoming the luxury connotations given to air conditioning poses the biggest problem for equipment makers. Trend is toward the simplified packaged unit which is within easy reach of the average home owner. Major producers have brought out about 50 new models of window-type room air conditioners within the last two years. These include York Corp., (which produces about 40 per cent of the room air conditioners built), Quiet-Heet Mfg. Co., Automatic Firing Corp., Bryant Heater Co., Carrier Corp., Chrysler's Airtemp Division, Fedders-Quigan Corp., GM's Frigidaire Division, General Electric Co., American Stove Co., Mitchell Mfg. Co., O. A. Sutton Corp. and United States Air Conditioning Corp.

Plans to sell the mass market include a "ready reckoner" for smaller types of packaged air conditioners which will tell the non-engineering salesman that, given a space of a certain size and other physical characteristics, model XYZ can be sold without further misgivings about technical considerations.

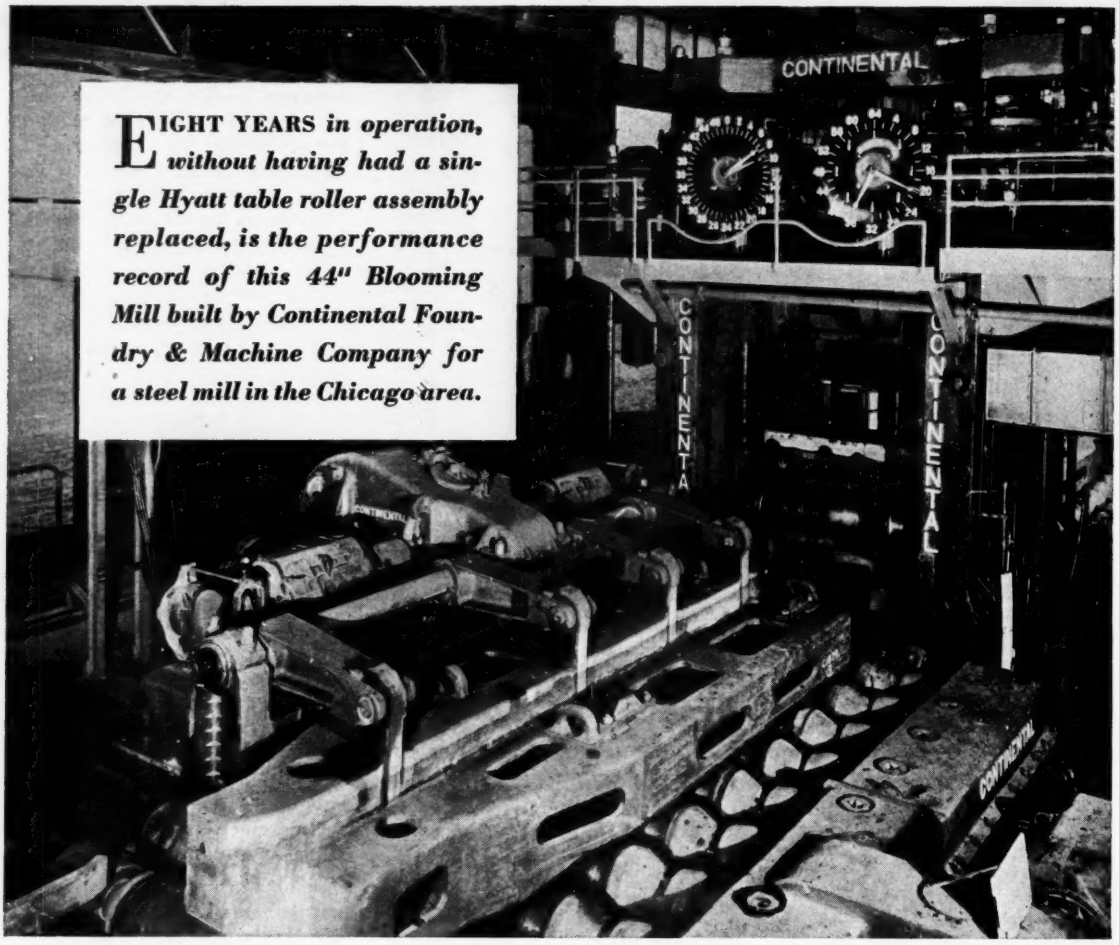
Further proof that the trend is taking hold is cited in ACRMA's estimate that 70 per cent of the room air conditioners sold in 1951 were bought by individuals for use in residences and apartments.

Proof, too, that room air conditioning is ready for the open market place is that big organizations, like Philco and RCA, with large, well-developed merchandising systems, are taking on a line of the small packaged units.

Westinghouse Humming

Westinghouse Electric Corp. will begin construction of a plant near Raleigh, N. C. to manufacture watthour meters. When completed in mid-1953, the plant will employ 2500 and increase production capacity of watthour meters 50 per cent. The plant will take over manufacture of all meters and is part of a $296 million expansion program, the second such expansion since World War II. The first amounted to $130 million and increased over-all capacity 50 per cent; this second program will also increase capacity 50 per cent.

Electrical equipment worth $9 million for four new pot lines at the Chalmette aluminum reduction plant of Kaiser Aluminum & Chemical Corp. was ordered from Westinghouse. Rectifier units, transformers and associated switchgear and centralized control and supervision apparatus comprise the equipment scheduled for delivery late this year.



EIGHT YEARS in operation, without having had a single Hyatt table roller assembly replaced, is the performance record of this 44" Blooming Mill built by Continental Foundry & Machine Company for a steel mill in the Chicago area.

HYATT Preference Earned by Performance

In steel mill tables, cranes, cars and mill motors, designs are such that the loads taken by antifriction bearings are predominately radial.

The simplest, most direct way to lay in bearings to take radial loads is to design with radial bearings. Straight cylindrical bearings provide maximum load-carrying capacity for a given space because no radial capacity is sacrificed to absorb thrust through the rollers.

Since radial bearings are a natural for so many steel mill applications it is no wonder that Hyatt Roller Bearings, with such a complete line, are the preferred bearings. A wide range of available sizes and types insures the selection of just the right bearing for each application.

Specify Hyatts for your new equipment or changeovers and take advantage of the high capacity, long life, resistance to shock loads and provision for axial shaft expansion that Hyatt Roller Bearings provide. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

One million UAW members win four cents more an hour as a result of the "annual improvement factor." That offsets the one cent lost because of price index declines

DETROIT

AUTOWORKERS' pay takes the spotlight as about one million UAW-CIO members begin drawing four cents more an hour in their base rates.

The increase is the result of the "annual improvement factor," a reward in recognition of the long-term average increase in productivity brought about by technological improvements. This pay hike is figured as pushing $80 million a year into this group of workers' purchasing power. Additionally, salaried workers in the industry receive corresponding increases.

Other Side of Coin—Simultaneous with the improvement-factor pay hike, however, the autoworkers (and their salaried colleagues) are taking a cent-an-hour (or $5 a quarter) cut in their cost-of-living allowance for the three-month period of June, July and August.

This cut reflects the drop in the Bureau of Labor Statistics' Consumer Price Index for the quarter ended April 15. This allowance is not figured as base pay of the autoworkers, and is in fact segregated so that it is not confused with earned pay. Geared to CPI it is in theory neither inflationary nor deflationary in its effects, being merely a method to permit a worker's purchasing power to remain steady regardless of the movement of prices.

There are in these two wage adjustments two areas for speculation: Are auto companies getting the increased productivity for which they are paying? Will auto prices be lowered? The answer to the first of these questions would seem to hold the key to the second. It will be recalled that each previous time the CPI was lower several of the automakers saw fit to reduce the prices of their cars. In the case of General Motors there were three price reductions—two in 1949, one in early 1950—each ranging from $10 to $40, varying between car makes although the cost-of-living cut was twice two cents an hour and once one cent. In these previous instances the car price reductions were made simultaneously with the announcement of the revision in the cost-of-living allowance.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	569,504*	680,281
May	550,000*	695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
April 26	135,769	162,740
May 3	130,108	154,523
May 10	130,509	130,577
May 17	129,914	156,127
May 24	128,388	158,259
May 31	115,000*	121,476

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Not in Prospect—This time there has been no price cut, and, as far as can be learned, none is in prospect. Automakers have by no means stopped or slowed their programs of installing new machinery aimed at making possible an increase in output with the same—or lessened—input of manpower. But in some cases workers do not permit the machinery to operate at its planned rate, and in many other instances the benefits of the machinery are negated by the limitations imposed on materials consumption and on finished product output.

Many automaking costs, furthermore, are due for an increase. Higher freight rates are going into effect; steel prices are certain to rise; Chilean copper is to be available at a premium price.

What Next?—A big question, wagewise, for the auto companies is: What happens when the steel workers win an increase? There are some men in the auto industry who believe they will be besieged with UAW delegations the moment the steelworkers and the steel companies reach an agreement on wages. On the basis of present UAW official thinking, however, there seems to be no danger that any new wage demands will be made. The UAW has publicly pledged its support to Philip Murray and stoutly insists that the steelworkers are entitled to the full amount of the WSB-recommended wage increase to enable them to catch up with other industrial workers. Several leading automotive industrial relations men are equally certain that a steelworker pay hike according to WSB terms will not establish a new pattern for their workers to shoot for.

The UAW will find it virtually impossible to get to first base if it should later on attempt to win any wage concessions from the automakers on the basis of a steel pay hike. Its bargainers would have thrown back in their faces statements made by President Walter P. Reuther which relate to the comparative position of steel and auto workers now and with the recommendations of the WSB imposed.

Mr. Reuther's Figures — Since May, 1950, says Mr. Reuther, GM workers have received 29 cents per hour in cost-of-living and improvement-factor wage increases (these figures are before the latest adjustments). The steelworkers got 16 cents in December, 1950, and with the 12½ cents recommended by WSB would be getting a 28½ cents total increase. WSB would give the steelworkers 2½ cents more in July "but auto workers meanwhile will have gotten another four-cent-per-hour improvement-factor increase. So the steelworkers will still be behind." As to fringe benefits, according to

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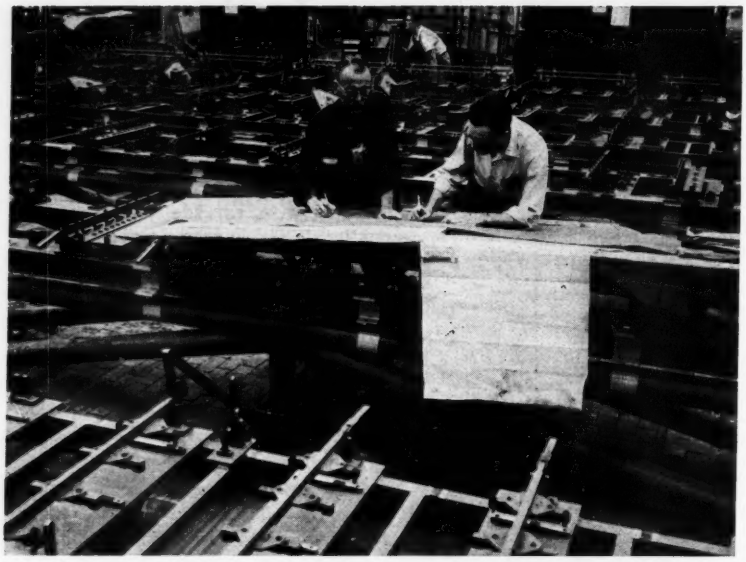


TRANSFERRING THE CHASE C-123 FROM PLANS TO PRODUCTION
. . . it takes longer than some congressmen think

Mr. Reuther, the autoworkers will continue to have it over the steelworkers on such counts as shift premiums, hospital-medical-insurance protection and pensions.

K-F Again Under Attack

Kaiser-Frazer Corp. since its formation has been a prize whipping boy. It has not yet been able to escape from the role. Not long ago it was accused by a congressman of soaking the Air Force too much for the C-119 Packet cargo plane it is producing. Another congressman—Alvin E. O'Konski (Rep. Wis.)—now picks up the club to attack not only K-F's aircraft program but also Henry J. Kaiser for his government "swindles" engineered by "placing his own key men in proper departments." Rep. O'Konski's blast also charges that no Chase C-123s have yet been produced although the contract for this cargo plane was awarded the 49-per cent K-F controlled Chase company a year ago.

Of the congressman from Wisconsin, Mr. Kaiser says, "He is grossly misinformed."

Out at Willow Run where Chase and K-F men are hard at work bringing into being an assembly line for the Chase C-123, there is much resentment over Mr. O'Konski's ignorance as to what is required before a new plane can be put into production. It, unlike the Fairchild plane, has never been in production. The plane is being transferred from designers' drawings into blueprints, and jigs and fixtures are being engineered and installed. No manufacturer, they say, can put a plane through the necessary engineering stages in the year's time which Mr. O'Konski considers such a long period. As to whether this work is proceeding fast enough, a K-F spokesman says: "We are extremely confident that we shall meet the Air Force schedules. Progress has been very gratifying so far."

One of the stumbling blocks against which K-F now is starting to bang shins is a shortage of manpower. K-F's projected hiring schedule is 500 a week with the goal being to raise employment by 8000 to 24,000 by the end of the year. Seeking unskilled as well as skilled men, K-F says the number of qualified applicants is "substantially below the figure required."

GM Readies New Bonding Method

Soon to be announced by General Motors Research Laboratories is a new method of bonding aluminum to steel. Although now proved as a production method, the process was tied up by a patent maze and certain technical problems such as lack of a container which would withstand the terrific attack of the salt solution required for the aluminum dip. One GM installation is at Harrison Radiator Division, Lockport, N. Y., where it reportedly is being used on a tank heat exchanger unit. Some of the earlier experiments with it included aluminum-coated mufflers and other high-mortality steel automotive parts.

Hudson Tries New Carburetion

Something new in the way of carburetion systems for passenger cars has been introduced by Hudson Motor Car Co. under the name of "Twin H-Power."

Consisting of two dual carburetors mounted at opposite ends of the intake manifold, the system is reported to give quicker response to accelerator pressure in the lower and middle driving ranges and at low speeds in high gear. Quadruple chambers were incorporated in the carburetors of three General Motors cars earlier this year for the same reason and as horsepower boosters. Hudson offers the twins as optional equipment on its sixes, except for the Pacemaker.

A clue to the upcoming Hudson light car was given by President A. E. Barit at his company's annual meeting. To be powered by a new engine which will develop better than 100 horsepower, the car will weigh about 2800 pounds, for a power to-weight ratio considerably better than other cars in the low and medium price fields. Though compact, it will seat six.

R. T. Keller To Run Arsenal

To Robert T. Keller his new assignment is like coming home. Mr. Keller, general manager of Chrysler Corp.'s Tank Plant at Newark, Del., has been given the additional responsibility of managing the Detroit Arsenal when Chrysler takes it over. His new title is general manager, tank manufacturing operations. In 1941 he was assistant master mechanic at the Chrysler-built tank arsenal, becoming works manager of the facility in 1943. He names as works manager of the Detroit operation Thomas F. Morrow, who was on the arsenal general manager's staff during the war, and since then has been on the staff of T. T. O'Brien, assistant to the vice president and general manager of Chrysler Corp.

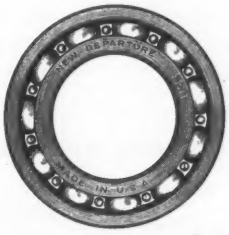
Theories proved or exploded here

• Before you place a new design on the market, it is important that you know how it will work under operating conditions.

Where the design involves the use of anti-friction bearings, New Departure's new, ultra modern testing laboratory can determine *in advance* what performance you can expect "in the field".

Furthermore, as the study progresses, New Departure engineers may find it possible to improve the performance or the assurance of success by applying their ingenuity and their fund of knowledge and over forty years experience to the subject at hand.

May we work with you on your anti-friction problems?



Nothing Rolls Like a Ball. . .

NEW DEPARTURE
BALL BEARINGS

158

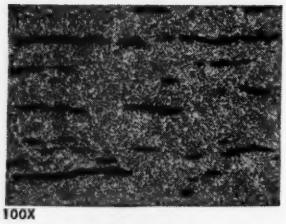
NEW DEPARTURE • Division of GENERAL MOTORS CORPORATION • BRISTOL, CONNECTICUT • BRANCHES IN ALL PRINCIPAL CITIES

TODAY'S BIG NEWS IN GAGES:

1. User reports show Graph-Mo® steel outwears other tool steels 3 to 1!

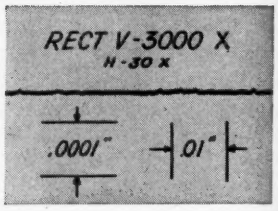
Gages made of Graph-Mo® steel are giving industry a great new standard of gage performance—with longer wear and greater stability than has ever been possible with gages made of any other tool steel! Proof of Graph-Mo's outstanding wearability: Reports from dozens of manufacturers who have switched to gages made of Graph-Mo steel show that Graph-Mo outwears other tool steels an average of 3 to 1!

Graph-Mo wears better because it contains free graphite and diamond-hard carbides. This structure gives excellent resistance to abrasion and has minimum tendency to pick up or gall. Tests on Amsler Wear Machine prove Graph-Mo has twice the resistance to galling when compared with conventional gage steels.



100X

PHOTOMICROGRAPH of Graph-Mo steel shows particles of free graphite and diamond-hard carbides which account for Graph-Mo's outstanding resistance to wear, pick up, scuffing and galling.



SMOOTH SURFACE FINISH—which also results in greater wear-resistance—is easier to get with Graph-Mo steel because of its excellent machinability. Above: Profilograph trace of Graph-Mo finish.

2. Tests on Graph-Mo steel master gage show only 10 millionths change in 12 years!

Gages made of Graph-Mo steel not only outwear others, they're more *stable* too! Using Johansson gage blocks, Zeiss optimeter, Sheffield optical comparator, and Graham-Mintel electronic comparator, the Timken Company measured a typical master plug gage at intervals and after a twelve-year period—found only ten millionths of an inch change. These gage measurements tell the story:

1940—1.73996	1944—1.73996
1941—1.73995	1945—1.73995
1942—1.73998	1948—1.73997
1943—1.73997	1951—1.73995

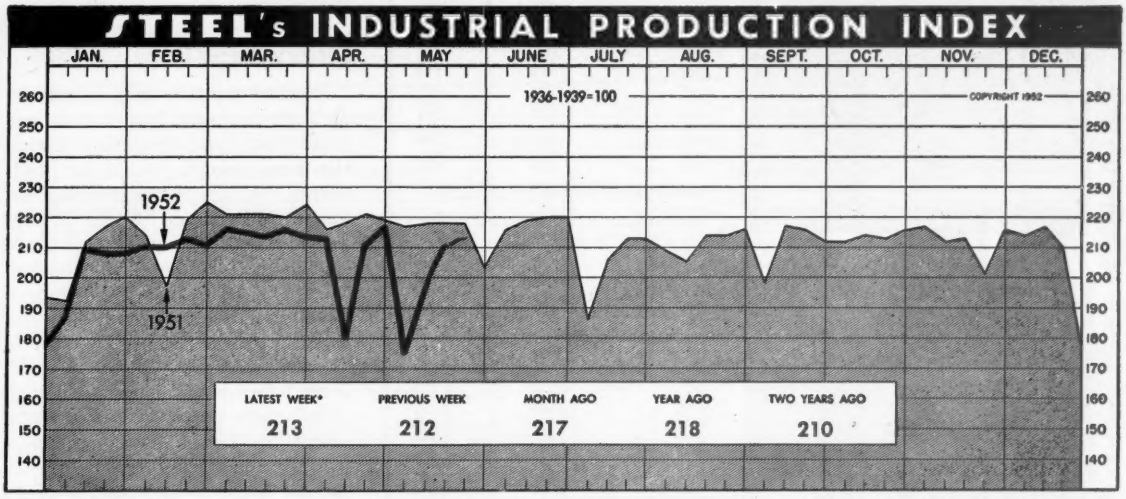
You can always tell Graph-Mo by its "graphitic look"—the tiny, scattered, parallel marks barely visible on the surface of a piece of polished Graph-Mo. This built-in "trade-mark", the result of free graphite in its structure, can't be duplicated in other steels. Look for it, insist upon it, next time you buy gages.

For further information on Graph-Mo's advantages to gage users and gage makers, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1936-1939=100
COPYRIGHT 1952
260 250 240 230 220 210 200 190 180 170 160 150 140
1952
1951
LATEST WEEK* 213
PREVIOUS WEEK 212
MONTH AGO 217
YEAR AGO 218
TWO YEARS AGO 210

* Week ended May 24 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Even though labor troubles continued to flare up in May most industries maintained high production. Industrial activity index edges upward

MOST of the nation's industries kept fairly high production schedules in May, despite the walkouts in the steel and petroleum industries.

That's due in great measure to defense work, which continues as the main support of business activity. It promises to play an increasingly important role, too. Deliveries of military equipment are expected to climb about $10 billion a quarter before leveling off at the end of the year.

Marking Time—Meanwhile, some dark shadows are still being cast on the civilian side of the industrial scene. Reports of production cutbacks keep coming in from manufacturers of stoves, refrigerators and other heavy appliances in particular. These metalworking companies are marking time until their inventories of finished goods have lowered to more normal levels.

Lifting of federal installment restrictions is causing some optimism—though not much—among producers of civilian goods. Most appliance manufacturers see a gradual rise in consumer purchasing throughout the remaining months of 1952, instead of a sharp upswing. As of now, the demise of Regulation W hasn't forced retailers to cope with any stampedes of dollar-waving customers.

Index—Marking an almost complete recovery from the effects of the steel walkout at the month's start, STEEL's industrial activity index inched up 1 percentage point to 213 per cent of the 1936-1939 average in the week ended May 24. Underlying factor in the slight rise was the 2 percentage point rise in steel production. Freight car loadings and auto-truck assemblies were slightly under the previous week; electric power generation continued its seasonal decline.

Auto Output Lags . . .

A flare-up of labor disputes brought down U. S. car-truck output about 2 per cent of the previous week's total in the week ended May 24. While independent carmakers showed gains, two of the big three automotive companies—Chrysler Corp. and Ford Motor Co.'s Lincoln Division—were set back.

U. S. and Canadian plants assembled 128,388 autos and trucks in the week ended May 24, a dip of 1626 from the previous week's output and below production during the same week in 1951 by nearly 30,000 units, according to *Ward's Automotive Reports.*

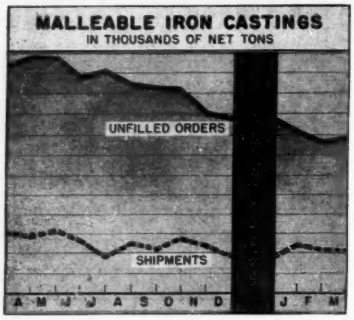
In the first four months of 1952, the U. S. and Canada produced 1,973,980 autos and trucks, compared with 2,797,651 during the same period of last year.

Tool Orders Drop . . .

In April—for the first time in three years—shipments of machine tools rose above the total new orders booked in the month. Although new orders have declined gradually in the past year, the industry has built up its productive capacity by substantial amounts in the last 15 months. With shipments exceeding new business the ratio of unfilled new orders to the industry's productive capacity declined to 15 to 1, the lowest ratio since December, 1950.

This means that at the beginning of May it would have taken the industry 15 months to fill its order backlog.

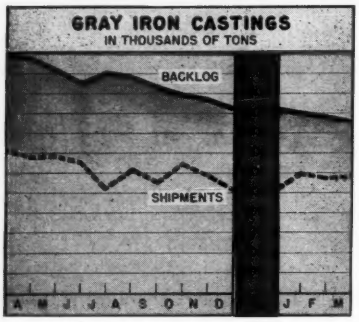
National Machine Tool Builders' Association reports that April shipments reached 309.7 per cent



Malleable Iron Castings
Thousands of Net Tons

	Shipments 1952	Shipments 1951	Unfilled Orders* 1952	Unfilled Orders* 1951
Jan.	87.0	92.5	203	234
Feb.	82.9	89.0	193.1	255
Mar.	81.0	101.7	196.9	267
Apr.	...	97.3	...	276
May	...	100.8	...	275
June	...	93.7	...	256
July	...	76.8	...	263
Aug.	...	90.7	...	249
Sept.	...	82.3	...	245
Oct.	...	93.9	...	238
Nov.	...	88.2	...	221
Dec.	...	76.0	...	215
Total	...	1,082.9		

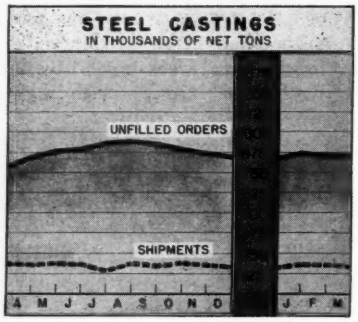
* For sale, U. S. Bureau of the Census.



Gray Iron Castings
Thousands of Net Tons

	Shipments 1952	Shipments 1951	Backlogs* 1952	Backlogs* 1951
Jan.	1,199	1,364	1,801	2,298
Feb.	1,155	1,234	1,766	2,392
Mar.	1,172	1,440	1,711	2,390
Apr.	....	1,363	....	2,337
May	....	1,396	....	2,229
June	....	1,309	....	2,162
July	....	1,029	....	2,208
Aug.	....	1,219	....	2,145
Sept.	....	1,115	....	2,055
Oct.	....	1,302	....	1,983
Nov.	....	1,184	....	1,934
Dec.	....	1,032	....	1,847
Total	....	13,768		

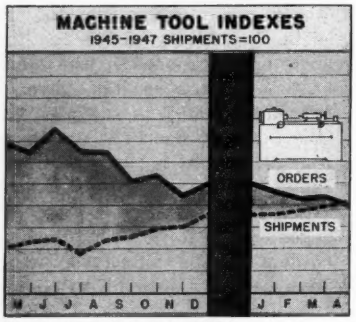
* For sale. U. S. Bureau of the Census.



Steel Castings
Thousands of Net Tons

	Shipments 1952	Shipments 1951	Unfilled Orders* 1952	Unfilled Orders* 1951
Jan.	183.7	174.1	869.3	675.4
Feb.	174.6	164.0	856.9	707.4
Mar.	173.7	190.7	857.1	779.7
Apr.	....	181.9	....	846.9
May	....	189.2	....	881.7
June	....	184.7	....	895.1
July	....	147.2	....	930.6
Aug.	....	177.1	....	944.2
Sept.	....	160.7	....	918.0
Oct.	....	189.9	....	891.5
Nov.	....	176.7	....	865.0
Dec.	....	165.1	....	846.4
Total	....	2,093.3		

* For Sale. U. S. Bureau of the Census.



Machine Tool Indexes
1945-1947 Shipments=100

	New Orders 1952	New Orders 1951	Shipments 1952	Shipments 1951
Jan.	347.8	475.4	266.6	114.3
Feb.	318.8	615.5	279.6	123.8
Mar.	324.3	590.3	299.5	158.9
Apr.	294.4	516.1	309.7	157.7
May	....	483.0	....	175.1
June	....	553.8	....	182.8
July	....	490.6	....	144.7
Aug.	....	458.9	....	178.9
Sept.	....	380.2	....	189.8
Oct.	....	403.9	....	221.3
Nov.	....	330.5	....	226.0
Dec.	....	376.5	....	264.7

National Machine Tool Builders' Assn.

Charts—Copyright 1952, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....May 5	Gear Sales .....May 26	Ranges, Gas .....Apr. 28
Durable Goods ....May 5	Indus. Production..May 26	Refrigerators .....Apr. 28
Employ., Metalwkg.Apr. 21	Ironers .....May 12	Steel Forgings .....Apr. 7
Employ., Steel ....Apr. 28	Prices, Consumer ..May 19	Steel Shipments....Apr. 21
Fab. Struc. Steel...Apr. 7	Prices, Wholesale ..May 19	Vacuum Cleaners...May 5
Foundry Equip. ...Apr. 14	Pumps .....May 12	Wages, Metalwkg...May 5
Freight Cars.....May 26	Radio, TV .....May 12	Washers .....May 12
Furnaces, Indus....May 26	Ranges, Elec. .....Apr. 28	Water Heaters ....May 19

of the 1945-1947 shipments. New orders that month declined 30 points from the previous month to 294.4 per cent of the 1945-1947 shipments.

Factory Wages Rise . . .

Factory workers averaged $1.66 an hour in April, 8 cents an hour more than the average pay during the same month last year, estimates the Labor Department. Between March and April of this years, workers earnings remained unchanged, although many industries reported slight declines as a result of reduced overtime. The average workweek of the nation's factory workers declined a half-hour between mid-March and mid-April, reflecting mainly the slackening in textile and consumers goods industries. Work stoppage in the steel mills contributed to the industry's over-the-month decline of more than one hour, says the Labor Department.

Freight Loadings Down . . .

Loading of revenue freight is continuing at levels substantially under a year ago. In the week ended May 17, total loadings amounted to 754,373 cars or 6 per cent under the same week last year, but 4.8 per cent above the preceding week.

From the total for the same week in 1951, coal loadings decreased by 16,670 cars, merchandise loadings decreased by 71,769 cars and miscellaneous car loadings were under the year ago figure by 24,298, reports the Association of American Railroads.

In the first four months of 1952, class I railroads put in service 838 new locomotives. Of the 192 new locomotives installed in April, all but one were diesel. Locomotives on order on May 1 totaled 1493, of which 30 are steam and the remaining 1463 diesel.

Vacuum in Sales . . .

In keeping with the general lag in household equipment manufacture, factory sales of standard-size household vacuum cleaners in April decreased 25 per cent from the previous month to 217,169 units, according to Vacuum Clean-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	103.5	101.5	103.0
Electric Power Distributed (million kwhr)	7,000	7,085	6,653
Bituminous Coal Output (daily av.—1000 tons)	1,393	1,337	1,606
Petroleum Production (daily av.—1000 bbl)	N.A.[8]	N.A.	6,177
Construction Volume (ENR—millions)	$237.9	$284.7	$177.1
Automobile, Truck Output (Ward's—units)	128,388	129,914	158,259
TRADE			
Freight Car Loadings (unit—1000 cars)	700[1]	754	812
Business Failures (Dun & Bradstreet, number)	150[1]	154	191
Currency in Circulation (millions)[3]	$28,497	$28,523	$27,287
Dept. Store Sales (changes from year ago)[3]	0%	+6%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,451	$15,681	$16,374
Federal Gross Debt (billions)	$259.1	$258.6	$254.7
Bond Volume, NYSE (millions)	$15.6	$14.6	$17.1
Stocks Sales, NYSE (thousands of shares)	5,947	4,863	8,780
Loans and Investments (billions)[4]	$73.2	$73.2	$69.6
United States Gov't. Obligations Held (billions)[4]	$31.4	$31.4	$30.4
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	232.4	232.4	241.6
All Commodities[7]	112.0	111.6	115.0
All Commodities Other Than Farm and Foods[7]	113.0	112.9	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100. [8]Not available.

ers Manufacturers' Association. April vacuum cleaner sales were 4.4 per cent below the 227,216 units sold in April, 1951.

Manufacturers shipments of plumbing fixtures in the first quarter dropped to a valuation of $58.6 million, the lowest quarterly shipments since the third quarter of 1949. First quarter shipments were 44 per cent the same period in 1951.

Allowances Cut . . .

As a result of the decline of the Labor Department's cost-of-living index since January, General Motors Corp., Ford Motor Co. and International Harvester are cutting employees' cost of living allowances by 1 cent an hour. This will effect the payrolls of 302,000 hourly rated GM workers, 104,000 employees of Ford, and 75,000 workers at International Harvester Co. Meanwhile, the Labor Department reports that the cost of living increased 0.4 per cent of the 1935-1939 average between March and April.

Steel Output Dips . . .

Memorial Day weekend was not expected to cut deeply into the nation's steel output, as few plants planned slowdowns in operations. American Iron & Steel Institute estimated that the industry would turn out 2,124,000 net tons of ingots and steel for castings in the week ended May 31, compared with the previous week's output of 2,134,000 net tons.

Heating Equipment Down . . .

Shipments of gas-fired central heating equipment in the first quarter totaled 155,000 units, compared with 215,000 units shipped in the same period last year, reports Gas Appliance Manufacturers Association. April shipments of gas-fired furnaces reached 22,000 units, about 8000 under shipments in April, 1951. April shipments of gas-fired boilers fell to 4000 units, 500 below the same month last year.

Trends Fore and Aft . . .

Loans of Federal Reserve member banks decreased $113 million in the first quarter. Commercial and industrial loans declined $73 million . . . Construction awards in the week ended May 22 were 6 per cent under the average 1952 week to date . . . General Electric is cancelling the closing of its plant at Erie, Pa. Instead the refrigerator plant will run at 50 per cent of normal capacity.

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- HOT ROLLED BARS
- STRUCTURALS
- HOT ROLLED PLATES
- ABRASION RESISTING PLATE
- HOT ROLLED AND COLD ROLLED SHEETS
- HOT ROLLED STRIP
- DEFORMED REINFORCING BARS
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- WIRE ROPE AND FITTINGS
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- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Flintuff Rolls
- Ohio Double-Pour Rolls

THE OHIO STEEL FOUNDRY CO.

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Men of Industry

DONALD C. POTTS
. . . Pittsburgh Steamship president

Donald C. Potts was appointed president of **Pittsburgh Steamship Division,** Cleveland, subsidiary, U. S. Steel Co. He succeeds the late **Walter C. Hemingway.** Since April, 1949, he has been operating vice president of this division, which he joined in 1913 as an accounting department clerk.

Harry F. Vickers becomes president, and **E. A. Pierce,** chairman, of the board of **Sperry Corp.,** New York, following retirement of **Thomas A. Morgan,** president and chairman, who has been with Sperry and predecessor companies for 40 years. **John Sanderson,** formerly vice president for finance and treasurer, was elected senior vice president.

Magnaflux Corp., Chicago, appointed **Hamilton Migel** to the newly created position of second vice president in charge of engineering, with over-all direction of research and design engineering. **Roy O. Schiebel Jr.,** midwest manager at Chicago, moves to New York as eastern manager. He is succeeded at Chicago by **Kermit A. Skeie.**

D. B. Craver was appointed general manager of sales for **American Can Co.,** New York. He served in Chicago as manager of sales for the company's central division.

C. E. Root was appointed regional manager, West Coast container sales, for **Rheem Mfg. Co.**

LESTER D. CHIRGWIN
. . . heads Consolidated Machine Tool

Lester D. Chirgwin, vice president of Farrel-Birmingham Co. Inc., Ansonia, Conn., was elected president of **Consolidated Machine Tool Corp.,** Rochester, N. Y., a subsidiary acquired by Farrel-Birmingham in 1951. He succeeds **Arthur H. Ingle,** who remains a director of both companies and will continue as corporation consultant. Mr. Chirgwin retains the vice presidency of Farrel-Birmingham.

Chester M. Adams was appointed general sales manager, **Bridgeport Brass Co.,** Bridgeport, Conn. He will direct sales of all company products. Mr. Adams has been with Bridgeport Brass for some years.

National Twist Drill & Tool Co., Rochester, Mich., appointed **William E. Atchley** general sales manager and **Frederick D. Lamb** assistant general sales manager.

E. B. Jennings, general superintendent, zinc mines works of **Tennessee Coal & Iron Division,** U. S. Steel Co., Birmingham, has been assigned special duties with TCI's raw materials department. He is succeeded at the Jefferson City, Tenn., operations by **Frank B. Brophy.**

P. D. Messler was appointed assistant manager of purchasing, **Inland Steel Products Co.,** Milwaukee, subsidiary, Inland Steel Co. He transfers from the Baltimore branch where he was in charge of purchasing and stock control. Other appointments include **Charles F. Kaberna,** appointed manager, order and service department, Milwaukee; **J. Dan Ray** as assistant manager, Baltimore; and **Frank Raschka** as Milwaukee territory salesman.

Worthington Corp., Harrison, N. J., appointed **Roy Carter** manager of its volute pump section; **L. H. Garnar** as manager, process pump section; and **I. J. Karassik** as manager, multistage pump section.

G. S. Hubbard, general manager of manufacturing, was elected a director and vice president-manufacturing, **Aluminum Cooking Utensil Co.** and Kensington Inc., New Kensington, Pa.

Pittsburgh Coke & Chemical Co., Pittsburgh, elected **W. Kenneth Menke** to the newly created post of vice president in charge of chemicals. He had been with Monsanto Chemical Co. for 17 years, most recently as director of its development department.

John F. McDaniel was promoted to manager of marketing, **Hotpoint Inc.,** Chicago. He has been sales manager.

Joseph Dixon Crucible Co., Jersey City, N. J., elected **H. W. Armstrong** vice president-finance; **J. P. Templeton,** secretary - treasurer; and **W. H. Buckhout,** comptroller.

Southern States Iron Roofing Co., Savannah, Ga., promoted **J. P. Doyle** to general manager of operations and **Cater Lee** to warehouse supervisor.

Miller Electric Mfg. Co., Appleton, Wis., appointed **A. E. Harrant** executive vice president and **A. C. Mulder,** vice president, production.

Edmund Pfeifer was transferred from Boston to become New York district manager of sales, **Lukens Steel Co.**

H. Paul Otto, supervisor of the Worcester, Mass., sales office, **Norton Co.'s** grinding machine division, replaces **Carl W. Atwood** when he

retires in July as district manager, Hartford, Conn. **John D. Putnam** succeeds Mr. Otto. **A. C. Moore** becomes field engineer, abrasive division, Detroit, and **Thomas M. Thornton** will be Detroit district sales engineer in the division. **Robert Cushman** becomes Pacific Coast district manager for Norton July 1, when he replaces **Lucien Gay**, who retires.

Cummins Engine Co. Inc., Columbus, Ind., appointed **Harold H. Hall** general manager, Cummins Diesel Export Corp. **Charles C. Sons** was named acting general service manager for Cummins Engine Co. to succeed Mr. Hall.

Clifford A. Glassman, formerly of Bendix Corp., is now associated with **Acme Industries Inc.**, Jackson, Mich., as purchasing agent.

James H. Heroy Jr. was appointed general manager of **Pittsburgh Plate Glass Co.'s** brush division. Associated with the firm's brush operations since 1946, he has served as assistant general manager for the last two years.

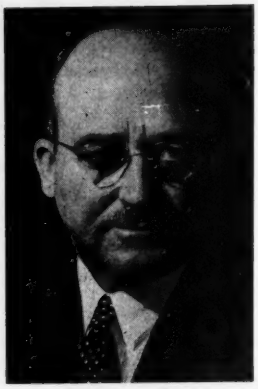
James V. Winkler was named head of the magnesium sales department's technical service and development group at **Dow Chemical Co.**, Midland, Mich. **R. D. Sweet** has joined the magnesium sales staff of the Los Angeles office.

Western Gear Works, Los Angeles, appointed **Harold Niemeyer** assistant to the area manager, and **Stan Coultas** production manager, Lynwood, Calif., plant.

Stuart Heiss, formerly with Inland Steel Co. and National Production Authority, is now associated with **M. S. Kaplan Co.**, Chicago. He will engage in purchase and sale of ferrous scrap.

M. F. Frankel was named manufacturing director of **Amgears Inc.**, Chicago, division of Hupp Corp.

The following were appointed branch managers of **Howe Scale Co.**, Rutland, Vt.: **Fremont Fisher** becomes manager, Chicago; **M. J. Kauffman**, Philadelphia; **J. R. Berry**, Denver; **C. J. Koch**, New Orleans, succeeding **C. C. Romig**, retired; and **O. B. Phillips**, Seattle, succeeding the late **Albert N. Lyons**.



GLOYD M. WILES
. . . V. P.-gen. mgr., Nickel Processing

Gloyd M. Wiles was named a vice president and general manager, **Nickel Processing Corp.**, and will be resident manager of the operation at Nicaro, Cuba. He continues as manager of the mining department of National Lead Co., which recently acquired a majority interest in Nickel Processing Corp.

Pennsylvania Salt Mfg. Co., Philadelphia, organized an investment analysis division and named **Edwin M. Ott** manager. Formerly these responsibilities were carried out in the market research division, headed by **G. T. Collins**, recently elected assistant to the president.

Bartlett Richards, assistant to the vice president in charge of production, was elected to the board of **Acme Steel Co.**, Chicago, to replace **R. H. Norton**, resigned.

Franklin Transformer Co., Minneapolis, appointed **Kenneth Dawkins** as general manager of its newly organized electrical division,

KENNETH DAWKINS
. . . heads a Franklin Transformer div.

and also in charge of sales for the division. He was with United Auto Parts of Canada.

Federated Metals Division, American Smelting & Refining Co., appointed **Walter W. Edens** to its sales engineering staff. He will be concerned primarily with the foundry trade.

Townsend Co. appointed **Edward C. Sterling Jr.** western division sales manager, with headquarters at the Cherry Rivet Division offices in Los Angeles. He replaces **Edward H. Stau**, resigned.

Russell B. Jenner joined **Richard C. Remmey Son Co.**, Philadelphia, as sales service representative for New England. He was with Harbison-Walker Corp

E. Stephen Farlow was appointed manager of the Baltimore sales office recently opened by **Sterling Electric Motors Inc.**

Steel Improvement & Forge Co. appointed **C. S. Markee** as sales representative for Indiana with office at 110 E. 51 St., Indianapolis. Mr. Markee formerly was purchasing agent of the San Diego, Calif., plant of Solar Aircraft Co.

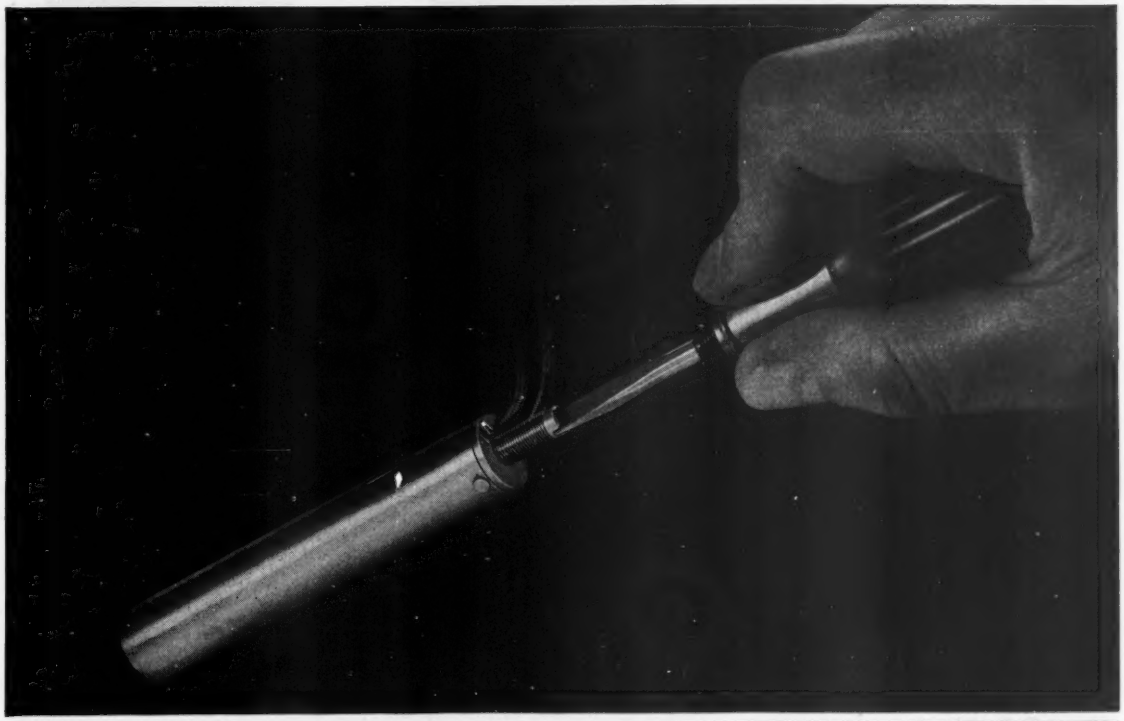
Western Electrochemical Co., Culver City, Calif., appointed **Robert S. Burns** president to succeed **Kenneth Walsh**, elected chairman of the executive committee.

A. R. McAllister, manager of the process equipment division, **Babcock & Wilcox Co.**, Barberton, O., retired after 32 years with the company.

Link-Belt Co. reports that **William L. Hartley**, sales manager at the Philadelphia plant, was transferred to executive sales headquarters, Chicago, to specialize in application of long-haulage belt conveyors and to assist on other major engineering projects.

Oliver United Filters Inc., New York, appointed **E. L. Oliver Jr.** executive vice president, a change from his recently appointed position of vice president-manager. He retains the duties of manager, but assumes broader administration responsibilities.

Ralph C. Archer, formerly vice president in charge of farm imple-



The Superior Tube That Keeps Cool in a Hot Spot

Cooling off customers' hot problems is a Superior specialty.

An example is illustrated above. The customer, Fenwal, Incorporated of Ashland, Massachusetts, manufactures THERMOSWITCH® industrial thermostats; Aircraft temperature controls, fire and overheat detectors; DETECT-A-FIRE® fire detectors. All of these products use stainless steel tubing. Before consulting with us an extra machining operation on the inside diameter was required. The tubing used needed a special temper for softness.

Problems like this one are tailor made for Superior. We produced for Fenwal a tube with a smooth, clean, almost mirror-like inside finish to eliminate the need for the extra machining operation. We were able to do this while still maintaining the low physicals necessitated by a stress cracking possibility.

What's more, the finished product was not a "specialty" tube. Our long experience in fine small tubing, backed by highly developed production equipment and extensive research and testing facilities enables us to produce tubing to the strictest specifications in large quantities. If you have a production problem involving the use of top-quality small tubing to do tough jobs well, check with us. We can probably supply you from the stocks of our distributors who are located in principal cities. Write for Catalog #20, Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

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All analyses .010" to ⅜" O. D.
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ROUND AND SHAPED TUBING

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A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100.

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5.

Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel.

Beryllium Copper

[1]West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

*Reg. U. S. Trademark International Nickel Company

ment division, **International Harvester Co.**, Chicago, was appointed vice president, manufacturing. He is succeeded by **Eugene F. Schneider**, general manager, farm tractor division, who in turn is succeeded by **Mark V. Keeler. Charles D. Harris** becomes general manager, refrigeration division.

Edward Taylor resigned from the executive staff of Hotpoint Inc. to become assistant to the president of **Motorola Inc.**, Chicago. **Ed Falls** was appointed Southwest regional manager, Motorola communications and electronics division, to succeed **John Jipp**, advanced to a new West Coast assignment for the company.

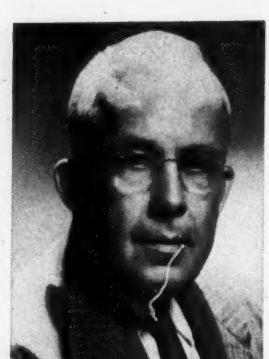
Emanuel Gordon joined the engineering department of **Metal Hydrides Inc.**, Beverly, Mass., where he will be in charge of special pilot plant operations.

Link-Belt Co., Chicago, appointed **George A. Most Jr.** district manager at Moline, Ill., to succeed **Stuart T. Penick.**

Fred A. Collinge was elected chairman, and **John A. Collinge**, president and general manager, **G. M. Diehl Machine Works Inc.**, Wabash, Ind.

Charles Castle was named sales manager, distributor division, **Webster-Chicago Corp.**, Chicago. He is succeeded by **Charles Dwyer** as assistant sales manager.

Harry W. Hultgren retired as sales manager, **Cushman Chuck Co.**, Hartford, Conn., after almost 30 years' association with the company. He will continue as a sales consultant.



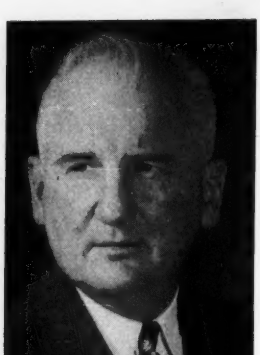
GEORGE W. BROWN
. . . Wagner Electric exec. engineer

George W. Brown was appointed executive engineer, **Wagner Electric Corp.**, St. Louis. He has responsibility of general executive direction of the electrical engineering, automotive engineering and metallurgical and chemical departments.

Kenneth Palmer was appointed assistant superintendent, melting department, at the Sanderson-Halcomb Works, **Crucible Steel Co. of America**, Pittsburgh.

Howard A. Blair was appointed product manager, self-contained products, air conditioning division, **Westinghouse Electric Corp.**, Pittsburgh.

Neal V. Robinson was appointed merchandising manager, consumer products sales, in the Chicago offices of **Kaiser Aluminum & Chemical Sales Inc. William B. Thomas** becomes product manager, extrusions, Chicago, and **Mortimer C. Crockett** was named assistant manager, New York office.



BLAIR BIRDSALL
. . . chief bridge engineer at Roebling's

Blair Birdsall succeeds **Charles C. Sunderland**, retired, as chief bridge engineer for **John A. Roebling's Sons Co.**, Trenton, N. J.

Jack R. Kruizenga was appointed manager of the Grand Rapids, Mich., factory branch of **Trailmobile Inc.**, subsidiary of Pullman Inc. He succeeds the late **Carl A. Lass.**

Russell, Burdsall & Ward Bolt & Nut Co. added new sales executives to the Pittsburgh area. They are **Richard D. Baker**, appointed resident vice president, and **Thomas Toby** as assistant manager of sales. **Alfred J. Fairfield** has retired from his positions as sales manager at the company's plant in Coraopolis, Pa., and as Detroit sales manager.

A. S. Kingerley was named assistant to E. J. Campbell, midwestern district sales manager, **Wolverine Tube Division**, Calumet & Hecla Consolidated Copper Co. His headquarters will be in Detroit.

OBITUARIES...

Dr. Marcus A. Grossman, 61, adviser-research and planning, research and technology division, **United States Steel Co.**, Pittsburgh, died May 21 after a long illness.

Arthur Simonson, 74, a former vice president, **Falk Corp.**, Milwaukee, died May 20. He had retired in 1946.

Harry O. Johnson, 56, former general superintendent, **American Steel & Wire's** central furnaces and docks, Cleveland, and since 1950 an assistant in the office of vice president of operations of the U. S. Steel Co. division, died May 22.

Peter A. Markey, 61, former president, **Bohn Aluminum Co.**, Detroit, died May 18. He retired two years ago.

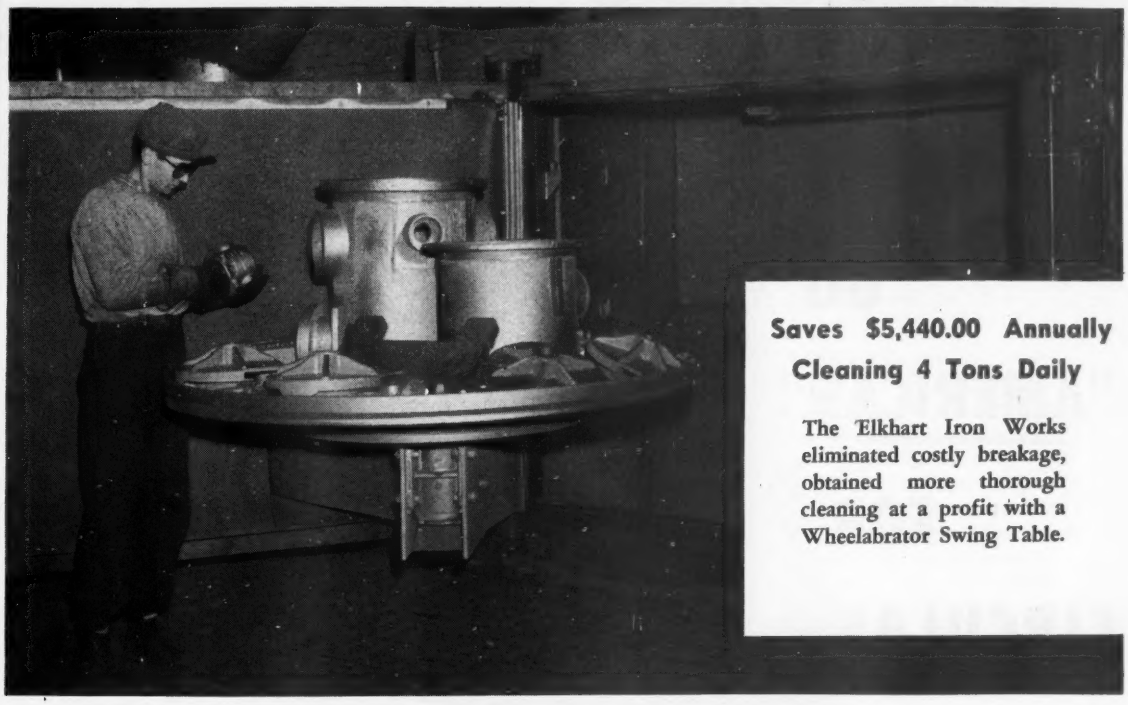
Arthur M. Long, 63, assistant general manager of sales, **Youngstown Sheet & Tube Co.**, Youngstown, died May 24.

John L. Perry, 71, who served as president of several **U. S. Steel Corp.** subsidiaries, including Carnegie-Illinois, died in Pittsburgh May 27. He retired Nov. 15, 1948.

Lawrence H. Smith, 54, plant superintendent, **Cleveland Steel Tool Co.**, Cleveland, died May 20.

Frederick D. Enterline, 54, purchasing agent, **Greenville Steel Car Co.**, Greenville, Pa., died May 20.

Wallace C. Eshelman, 63, general superintendent of **Bethlehem Pacific Coast Steel Corp.'s** South San Francisco steel plant, died May 14.



Saves $5,440.00 Annually Cleaning 4 Tons Daily

The Elkhart Iron Works eliminated costly breakage, obtained more thorough cleaning at a profit with a Wheelabrator Swing Table.

SMALL FOUNDRIES agree: *"It's good business to install a cost-saving WHEELABRATOR®"*

Are you putting off modernizing your cleaning room because you believe your tonnage is too small to justify the use of Wheelabrator airless abrasive blast cleaning equipment? Many foundry owners, who once shared this belief, now say they couldn't afford to operate without their Wheelabrator. They have discovered that, "It's good business to install a cost-saving Wheelabrator."

Here's how the WHEELABRATOR will save for you

Saves Time - Speeds Production: Wheelabrator speed cleaning saves many costly man hours by handling a greater quantity of castings in much less time.

Provides Competitive Advantages: A Wheelabrated finish *(all* sand and scale removed) is an important sales factor. More and more firms are demanding this surface cleanliness.

Creates New Sales Opportunities: Wheelabrator's fast, thorough cleaning puts your services on a par with competitors.

Profitable Job Cleaning Possible: Many foundries utilize their Wheelabrator part time for job cleaning.

Returns Investment Quickly: Savings effected are usually sufficient to amortize investment in six to 18 months.

Here's how the WHEELABRATOR has saved for others

Saves 18 Man - Hours Per Ton: A Wheelabrator Swing Table saved $4,644.00 annually cleaning only 43 tons monthly for a Canadian steel foundry.

Saves $7.06 Per Ton: The Keystone Brass Works, Inc. slashed cleaning costs 67% with a Wheelabrator Tumblast. Annual production only 550 tons.

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Catalog 74-A-describes the Wheelabrator and shows what it is doing for others.

Bulletin No. 26- explains Wheelabrator's liberal deferred payment plan.

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Production AND Engineering
NEWS AT A GLANCE

THROW IT OUT: CHEAPER—What's the best and cheapest way to make a part? Best and cheapest, says Lee Fraser, is to eliminate it. Sounds rather drastic, but according to Arma Corp.'s production manager, it works. In supporting his theory, he illustrated to members of the New York chapter of ASTE what Arma plans in simplifying the housing construction of rotating components. He pointed out that instead of turning the housing from tubing, and end caps from bar stock—all held together by eight screws—the company finds it more economical to purchase an extrusion die and turn a closed end housing from an impact extruded shell or cap. This gives better alignment than 3-piece construction. Further, manufacture involves roughly two operations as against 20 previously.

GLASS "GREASE" DOES IT—The French hot extrusion process currently used by Babcock & Wilcox, opens a new horizon for producing seamless tubing and solid shapes from the more refractory stainless steels, and highly alloyed and high melting point metals. Success of the process stems from the use of glass as a lubricant which in turn has a revolutionary effect on both die life and surface quality. Melting on contact with the hot steel, the glass prevents seizing of billets and tools, and insulates the tools from heat. p. 92

BOON TO PATTERN MAKERS—Pattern makers are in for a morale lift—due mainly to the face-lifting given to ordinary sandpaper by Bay State Abrasive Products Co. Searching for the reason sanding materials had a short work life company designers found the answer: Sanded stock starts clogging the abrasive so it cannot work. The solution: To give these removed particles a place to go. Now the company is producing a sanding material that keeps on working—from 10 to 15 times longer than ordinary sanding papers. How's it made? By imbedding the abrasive in a tough open-mesh fabric that holds the abrasive firmly, but lets the removed particles flow through the holes. Bay State expects to make it for use on both wood and metal.

OIL FROM COAL CLOSER—New cheaper method of removing carbon dioxide from synthesis gas is seen as a step closer to the day when production of oil from coal on a commercial scale begins. Developed by Joseph H. Field and Homer E. Benson of the Bureau of Mines, the gas purifying method employs a hot, concentrated solution of potassium carbonate to absorb carbon dioxide. Absorption occurs at pressures of 300 to 600 pounds per square inch, which are used in the gas-synthesis process. The carbonate solution is regenerated by pressure let down and steam dripping at substantially the same temperature used in the absorption step. This eliminates the need for heat exchanger treatment used in the conventional method, and reduces amount of steam consumed. Method is expected to be used in other processes, notably the production of synthetic ammonia from either coal or gas.

VIBRATION "BLOODHOUND"—Now, an average mechanic can easily balance newly assembled lathes. The reason: A new electronic discriminator that literally pinpoints sources of vibration. The portable instrument goes beyond existing dynamic balancing equipment in an ability to measure vibration in terms of how often and how much as opposed simply to where and how much. It simplifies and speeds up the process of obtaining all necessary information for analysis. p. 99

TINY "PANTS" FOR WIRES—If you're looking for an extra fine diameter wire covering to meet your requirements, Irvington Varnish & Insulator Co. has it. The Irvington, N. J. company is now turning out a newly developed tiny diameter extruded plastic tubing to satisfy covering requirements of wire employed in miniature motors, relays and condenser leads in the electronic industry. Inside diameter of the tubing is 0.012-inch.

MORE "PIGS" FOR FOUNDRIES—Cast iron borings or swarf no longer need be lost to industry. An English development that reclaims the material under normal foundry conditions now makes it possible to look upon borings as being equal to scrap iron or pig from a liquid metal producing point of view. Heart of the development is a device that melts the borings in the cupola as a regular part of the cupola mixture without necessity to briquette, canister or treat the metal in any way prior to melting. p. 97

SHELL MOLDING TODAY—Despite such obstacles as secrecy, a confused and misleading patent situation and a general lack of specially-designed equipment, shell molding is making rapid advances. In a year and a half, here's what happened: New automaic molding machines reduced the process to a pushbutton operation in which unskilled female operators can produce up to 60 molds per pattern per hour; Casting sizes, previously limited to 20-30 pounds, are in the 200-pound range and still going up; Mold patterns, formerly produced in 3 or 4 minutes, now are made in less than 30 seconds. Polished gray iron having a carbon content of 3.65 seems to be the most desirable pattern metal, but satisfactory shells may be made with almost any metal pattern. Actual production work is being done with patterns of high copper content alloy.

Placing the fiberglass sock over the mandrel at extrusion press. Transfer car carrying billet is visible approaching the press at the center of the photograph

FIBERGLASS SHEATH THE SECRET

New Method Makes Stainless Extrusion Practical

Babcock & Wilcox Co. installs first plant for forming seamless tubing and solid shapes from difficult alloys by Ugine-Sejournet process using glass as lubricant

OPENING a new horizon for production of seamless tubing and solid shapes from the more refractory stainless steels and highly alloyed and high melting point metals, hot extrusion looms large as a process with wide commercial application. Babcock & Wilcox Co.'s Tubular Products Division at Beaver Falls, Pa., in late 1951 put into operation the first American extrusion press having the speed and other design features necessary to take full advantage of the French Ugine-Sejournet hot extrusion process.

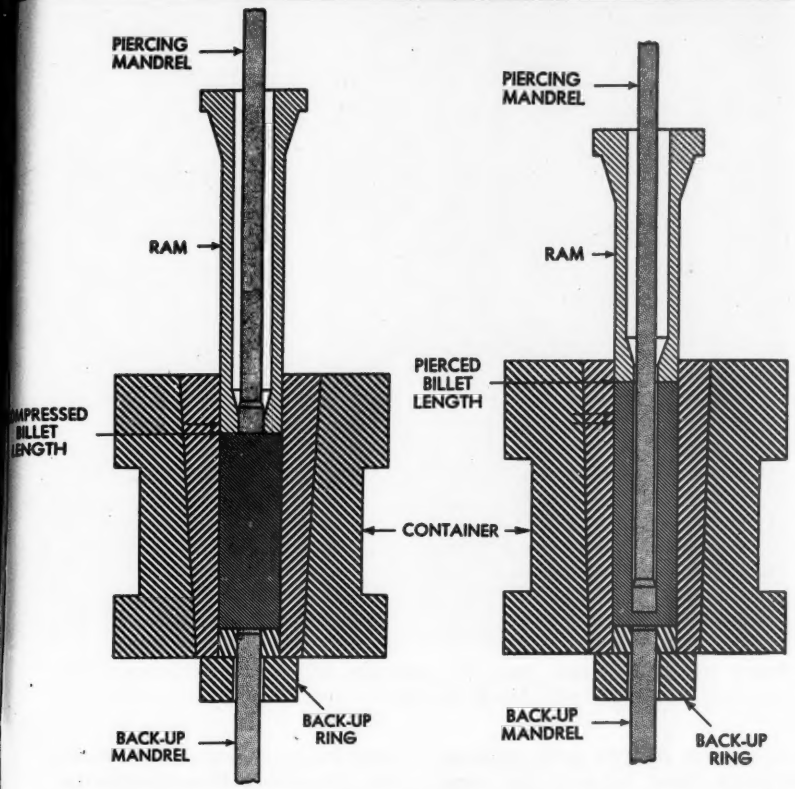
Tubes produced in the first day's operations were B & W Croloy 18-8S (type 304) of salable quality. Since the first of the year the plant successfully has extruded Croloys 18-8S (type 304), 18-8S T1 (type 321), 25-20 (type 310), 16-13-3 (type 316) and 27 (type 446); pure molybdenum; and pure titanium. Noteworthy also is the extrusion of a tube from a round cornered square continuous cast billet, wherein a finished tube was produced from molten steel in just three operations.

Ugine-Sejournet process, using glass as a lubricant, results from research and development work dating back to 1940 at Comptoir Industrial d'Etirage et Profilage de Metaux in Persan, France. Over the years the process was studied from the standpoint of form of glass applied, metal flow, die analysis and design, heating, and desired speed and required pressures of extrusion until it finally evolved as a practical method for producing solid shapes and tubes.

Glass Does It—Substitution of glass for the carbonaceous materials previously used as lubricants was the most significant discovery and the one having a revolutionary effect on die life and surface quality. Glass, melting on contact with the hot steel, prevents seizing of the billet and tools plus insulating tools from heat. Excellent lubricating properties of the glass reduce friction and make possible increase in billet length. Once number of extrusions per hour is determined, length and consequent weight of billet determines tons per hour produced.

This is how the lubricant affects maximum length of billet

Big 2500-ton press in Babcock & Wilcox Co.'s Beaver Falls plant using glass lubricant makes it easier to extrude tough metals and alloys



Precompression of billet prevents eccentric piercing in separate vertical press (left). Piercing operation (right) consists of drying mandrel to within an inch of bottom, completing pierce when backup mandrel retreats

which can be pushed: A definite amount of work done at the die requires a definite pressure in the steel at that point. Friction resulting from this pressure pushing out against the side of the container makes additional work necessary which requires additional pressure; the additional pressure contributes to the friction force.

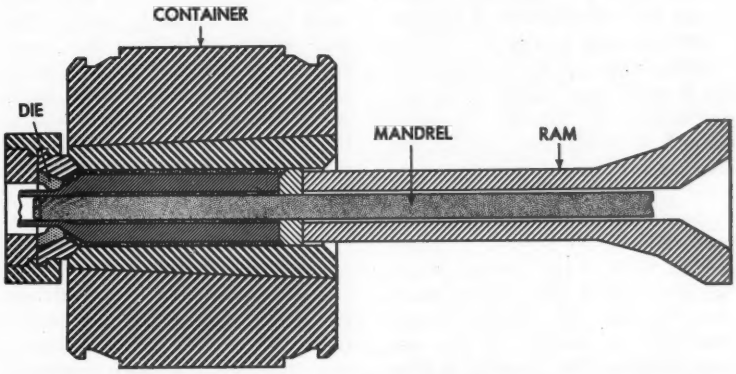
With a poor lubricant, this cumulative pressure resulting from friction builds up to the full force of the press in a short length of billet. With the proper lubricant, the cumulative pressure build-up is slower. For the same amount of actual metal deformation and starting pressure, more inches of billet are accounted for before the full push of the press is used up. Additional inches (or pounds) of billet produced by each push means additional tons per hour of output, since the number of pushes per hour is negligibly affected by the billet length.

Tubes Squeezed Out—In the extrusion of tubing, a hollow billet is confined in a container between the ram of the press and the die. Extending from the ram is a mandrel passing through the billet and the die. As the ram moves forward, metal is squeezed out between die and mandrel. Die determines the external contour and the mandrel the internal contour.

Although it is possible to produce the hollow billet by forcing the extrusion mandrel through it prior to extrusion in the same press, this method has limitations with regard to mandrel strength and stiffness. An alternate method used by CIEPM, and adopted by B & W makes use of a separate vertical press for piercing.

Benefits resulting from the type of separate piercing press used in this process are primarily concerned with the concentricity of the final tube. Obviously, this concentricity depends on the concentricity of the pierced billet just prior to extrusion.

In a separate press, it is possible to pierce a slightly oversized hole in the billet. This preliminary step permits the use of a larger, and consequently stiffer mandrel, resulting in less mandrel wander at the far end of the pierced billet. Using the larger size diameter mandrel is important because the extrusion mandrel length to diam-



An extrusion billet is confined in container between press ram and die. Forward motion of the ram squeezed out metal between the die mandrel

eter ratio may be about 30:1 in some cases.

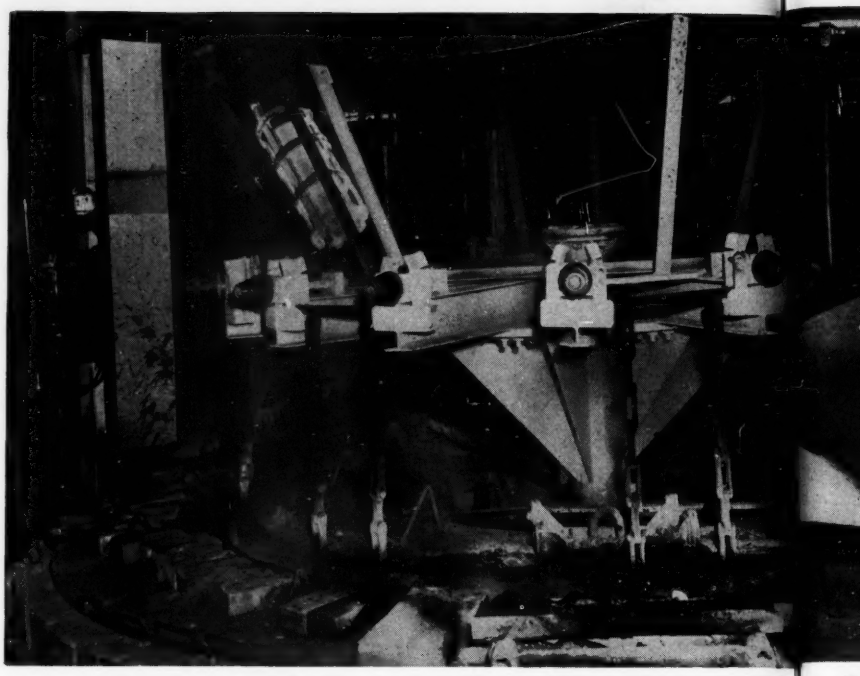
Full Pot—Design of the press provides for compression of the billet to make it fill the container prior to piercing, preventing eccentric piercing resulting from the billet lying off to one side of the container. When the billet is compressed to fill the container completely and the mandrel is accurately guided down the center with no tendency to be pushed off-center because of one-sided distribution of metal, a concentric pierced billet is produced.

By the use of a separate piercing press, it is possible to place the billet in the extrusion press so that the first end pierced is farthest from the ram during the extrusion operation. At this point, the extrusion mandrel is flexible and will need convergence of concentric metal to hold it on center. As the ram approaches the die, the effective length of mandrel becomes less and its stiffness provides a corrective effect on concentricity.

Thus, there are three separate concentricity correctives resulting from the use of this piercing press:

1. Precompression of the billet fills the container and prevents random off-center displacement of the billet and consequently the mandrel.
2. Stiffness of the oversized piercing mandrel gives more concentric piercing throughout the entire length of the billet.
3. Placement of the pierced billet in the extrusion press so that the accurately pierced top end is extruded first when the extrusion mandrel is long and not stiff enough to hold center without the convergence of concentric material to help it.

Special Setup—Arrangement of the B & W plant designed for the production of tubular or solid shapes, is illustrated. Billets are charged into a rotary hearth gas-fired furnace. After heating, if they are to be made into tubing, they are rolled across a glass-pickup table to the piercer charging device, or if they are for solids they by-pass the piercing operation and go directly to the salt bath furnace. The piercing is done with glass interposed between billet and piercing mandrel and depending on analysis either with or without glass between the container and the billet. The piercing operation consists of precompression, piercing to within an inch of the cylinder-bottom which is closed by a backup mandrel and finally completing the pierce when the backup mandrel retreats.



Rotary salt bath furnace used for reheating billets to be used provides the extrusion press with billets as nearly free from scale as possible

The pierced (for tubes) or the unpierced (for solids) billet is charged into a metal basket which supports it in a rotary salt bath furnace. A hook on the surface of a large drum lowers the basket onto a carrousel support and a cam-type surface on the drum rotates the carrousel forward. The next basket is indexed into position where the hook will be in location to lift it from the bath. After circling through the furnace, the basket is lifted out by the drum and the billet discharges into a trough on a transfer car.

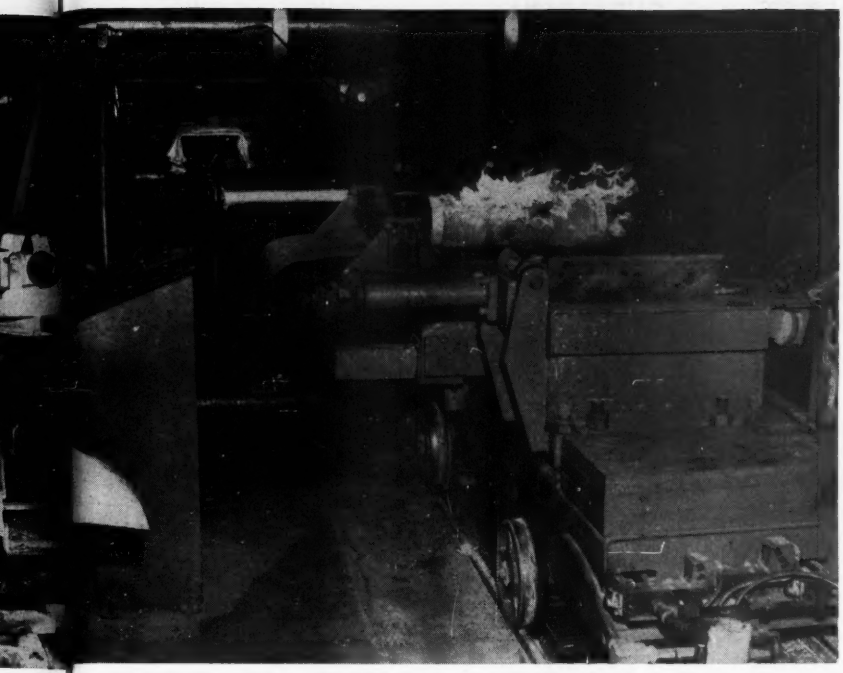
Transfer car has an inclined surface on which a fiberglass mat is placed. As the car travels toward the extrusion press, the billet is raised out of the trough and rolled down the inclined plane fusing to the fiberglass mat and picking it up. When the transfer car reaches the end of its travel, the billet has rolled into a trough at the front end. The trough lines up with the container bore and billet is automatically pushed into container.

Protective Sock — Previous to this time, a fiberglass sock is slipped over the mandrel and a glass cartridge placed against the die. With the mandrel lubricated by the fiberglass sock, the die lubricated by the cartridge and container lubricated by the glass picked up by the billet in passing across the transfer car, metal to metal seizure is prevented on all surfaces.

Actual extrusion takes place in from 2 to 4 seconds, yielding a piece from 20 to 60 feet long depending on the size of billet and area of extruded section. The tube may be cut into shorter lengths on a hot saw and either quenched or rolled onto a cooling bed, depending upon analysis.

Gas-fired rotary hearth furnace used for providing piercing temperature to billets for tubing, or preheat temperature to billets for solid extrusion, has a 23-foot hearth diameter. Heating capacity is 5 tons of steel per hour from room temperature to 2250° F.

The 500 ton vertical piercing



Billet covered with fiberglass mat being delivered to an extrusion press by transfer car. The billet is automatically pushed into the container

press has containers ranging up to 8 inches in diameter. The stroke on this press is 34 inches, enough to supply a 28-inch pierced billet to the extrusion press. After piercing, the container of the press can be shifted either under the piercing cylinder or out over a stripping cylinder where the pierced billet is pushed out and the next solid billet is received.

Clean Billets—Rotary salt bath furnace used for reheating pierced billets and for completing the heating of the billets to be used for solid extrusions is rated at 5 tons per hour from 1600° F to 2250° F. It is powered by six 150 kw, three phase transformers switched on and off by automatic temperature control. Purpose of salt bath heating is to provide the extrusion press with billets as nearly scale free as possible.

Extrusion press rated at 2500 tons has containers to handle up to 8-inch billets. The unusually long stroke of the main ram is 100 inches to allow a billet 28 inches long to be placed in front of the container before the start of the stroke. One feature of the Ugine-Sejournet process is a very fast extrusion stroke which minimizes tool heating. The press is designed with a prefill speed of 21 inches per second and a possible power stroke speed of 6 inches per second. The press operates on 3600 psi-water supplied from two air-water accumulators, one for the supply of the main cylinder and the second for the supply of auxiliaries and also the piercing press. The purpose of the divided supply is to provide variable main ram pressure if needed.

Lubricant Makes Difference — Extrusion process has been used on stainless steels, on both hydraulic and mechanical presses, in Germany, Britain and the U. S. Usual practice in these instances has been to use graphite or carbon-containing lubricants on the dies and tooling with the result that carburization has been a problem. The Ugine-Sejournet process, with the glass lubricant, solves this difficulty and makes the operation much more practical from the standpoint of American production standards. Extrusion ratios are increased by use of this process.

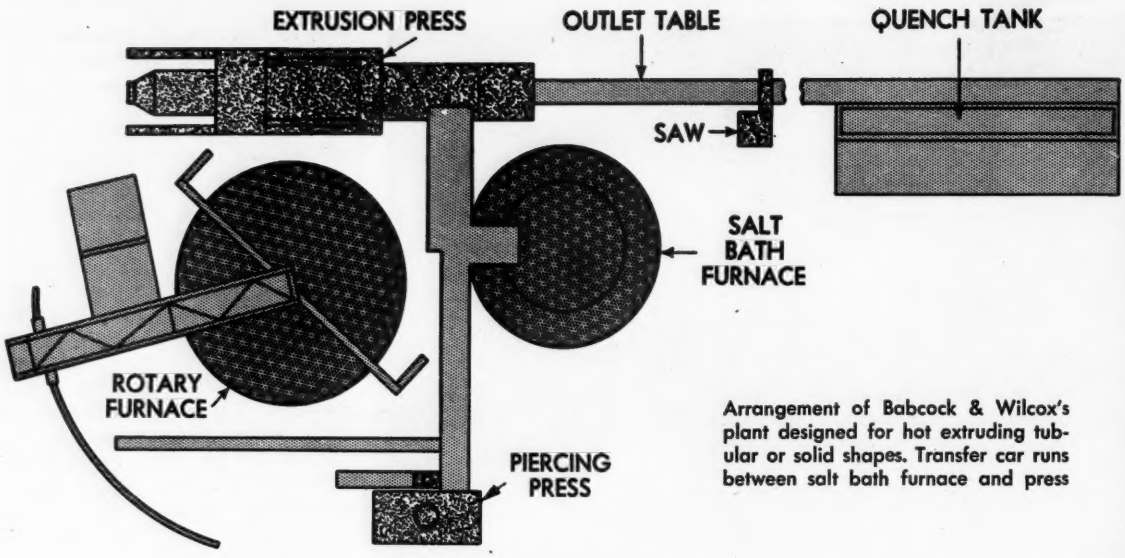
Numerous highly alloyed steels not readily procurable in seamless tube form may be made available by this new process, including such unbalanced compositions as 25 per cent Cr-12 per cent Ni, 25 Cr-12 Ni-0.8 Cb, 25 Cr-20 Ni-Cb, 25 Cr-20 Ni-2.5 Mo, 17.5 Cr-9 Ni-2.5 Mo, and 19 Cr-10 Ni-3 to 4 Mo.

Process is adaptable for the stainless bearing steels, types 440-A, B & C and the several varieties of free machining stainless steels not successfully pierced by the rotary piercing method. There are many others such as several of the acid-resisting alloys, tool steels and the super alloys used in gas turbines. Other materials such as molybdenum metal, vanadium, titanium and zirconium could be included in this list. Where necessary these materials can be further processed after hot extrusion although in most cases some modification of regular finishing practices will need to be instituted in keeping with the characteristics of the specific material.

Commercial Significance — For the higher grade alloys, tubular extrusion enjoys a considerable economic advantage over rotary piercing particularly where cold reduction takes place subsequent to the production of a hot finished tube. The advantage, B & W says, is the ability of extrusion to accomplish the following:

1. Produce a tube free from breaks in the surfaces such as may be found on a rotary pierced tube.
2. Produce smaller, lighter walled tubes than rotary piercing thereby eliminating cold passes.
3. Produce high alloy tubes at a faster rate per man-hour than is possible by rotary piercing.

Extruded surfaces already produced have required almost no grinding on the outside surface, and the internal surface has been so good that no work need be done, even on requirements for redrawing. This has resulted in a reduction of better than 50 per cent in the work and material previously lost in grinding out surface defects. This is an important gain because in some cases the conditioning can account for substantial production costs. It is expected that the surface finish will show further improvement.



Arrangement of Babcock & Wilcox's plant designed for hot extruding tubular or solid shapes. Transfer car runs between salt bath furnace and press

Cold Work By-Passed — Ability to produce a small light wall tube by extrusion also by-passes an appreciable amount of cold work. While leaving a sufficient number of passes to assure the surface and mechanical characteristics of a cold worked tube, the pattern of sizes is such that roughly half the cold work passes may be eliminated by producing tubing by extrusion. Thus, both the saving in passes and the reduction in conditioning time will have an impact on the in-process time, with resultant beneficial effect on delivery time.

For stainless steels, production per man-hour by extrusion will actually exceed that of a rotary piercer, rolling mill and reeler setup with a rotary furnace producing a similar range of sizes. Although less pieces per hour are produced on the extrusion press, the weight per piece is far greater than that produced on a rotary piercer. It is estimated that the production per man-hour by extruding is 30 per cent greater.

In high alloy business where small orders are prevalent, flexibility of production is another prime advantage offered by extrusion. To change size on the extrusion press requires replacement of the mandrel and the insertion of a different size die. Less than 4 minutes are required to make this change.

In the case of carbon steel and low alloy steel grades the output in pieces per hour on the rotary piercer is so high that it is doubtful whether the extrusion method could compete.

A general feature of economic importance is the ability of the extrusion process to produce special cross-sectional shapes either tubular or solid. In the case of solid shapes, this means of production compared with rolling is particularly economical in terms of tool and changeover costs for small quantities. Extrusion in tubular form may be made in a variety of shapes other than circular with fins or wings of various kinds on both the interior and exterior surfaces.

Accurate Control of Grain Size

Importance in the metallurgy of brass to be used in the manufacture of jewelry, watch cases, pens and pencils, and other small brass objects, is alloy's grain size.

Success in drawing, stamping or forming these brass parts depends on certain physical qualities which, in turn, are determined to a large degree by uniform grain size.

Proper Regulation—To achieve this vital uniformity, Chase Brass & Copper Co., Waterbury, Conn., anneals coils of strip brass in large bell-type annealing furnaces that permit accurate control of grain size. Furnaces' closely regulated heating and cooling does the job.

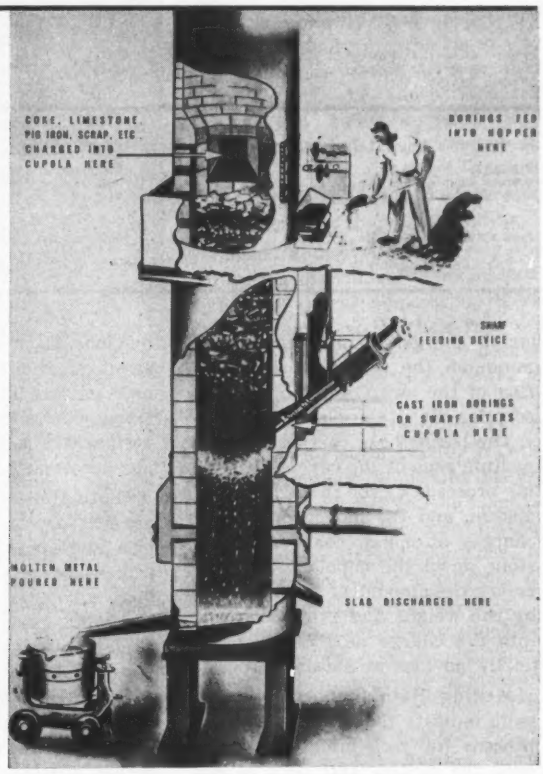
As much as 10,000 pounds of brass strip is loaded on furnace pallets at one time, then covered with a steel bell. Base of the bell fits into an oil-filled groove that seals out the air. Over this is lowered the gas fired heater.

During the five-hour annealing period the bell is filled with a nonoxidizing atmosphere. This makes the brass as bright after annealing as before. After proper annealing temperatures have been maintained for sufficient time, the bell is removed and brass allowed to cool slowly.

BELL-TYPE ANNEALING
. . . maintains alloy grain size

New Process Reclaims Borings

English development reclaims metal under normal foundry conditions at great savings. Method is being made available to foundrymen in U. S., England and Canada


COKE, LIMESTONE, PIG IRON, SCRAP, ETC. CHARGED INTO CUPOLA HERE
BORINGS FED INTO HOPPER HERE
SWARF FEEDING DEVICE
CAST IRON BORINGS OR SWARF ENTERS CUPOLA HERE
MOLTEN METAL POURED HERE
SLAG DISCHARGED HERE

Iron foundry cupola using the new process and swarf feeding device for melting cast iron borings. Borings agglomerate quickly, sink rapidly with rest of charge

CAST IRON borings or swarf no longer need be lost to industry. Not only is there money in them, but also undetermined millions of tons of cast iron for foundries all over the world.

In fact, cast iron borings now can be looked upon as being equal to scrap iron or pig from a liquid metal producing point of view.

The reason: A novel process for reclaiming the metal described by Arthur Croft, chairman and managing director of Crofts Ltd., who arrived from Yorkshire, England, to introduce the method to American foundries.

Mr. Croft says that during the machining of iron castings an average of up to 15 per cent of the initial weight is removed in the form of swarf, commonly known as borings. A large proportion of this weight of swarf is lost to the foundry industry due to the difficulty of melting it economically and satisfactorily in foundry cupolas.

Now, he says, the new process makes it possible for cast iron borings to be reclaimed under normal foundry conditions with large savings in cost—at the same time raising the total weight of cast iron available for castings. The device involved in the method has been working on the firm's own cupolas and is now, after months of trial, offered for sale to foundrymen in England, United States and Canada.

What It Is—The device which makes the process work—that is melt the borings in the cupola as a regular part of the cupola mixture without necessity to briquette, canister or treat the borings in any way prior to melting—consists of a pneumatically-operated injector ram incorporated in the entry duct of the cupola. Intermittent strokes of the injector ram force the material in the charge.

Operated by a compressed air cylinder from the rear of the entry-duct, the ram consists of a pointed 0.4 per cent carbon steel shaft some 2 inches diameter to which are welded, at staggered intervals over about 12 inches of its lower end, a number of shaped lugs. The ram is mounted centrally in the duct, and by each stroke through the borings the lugs push forward a quantity into the furnace.

Protective devices prevent the ram from entering the hot zone of the furnace when the duct is empty, or from stopping at the bottom of its stroke. Control valves allow the operator to alter at will the speed of ramming from zero to a maximum of about 30 strokes per minute.

Oversize material is rejected by a 1¼-inch mesh grid at the chute entrance, and flow at the entrance to the chute is assisted by an external electrical vibrator.

How It Works—Here's the procedure involved in the process. First, cast iron borings are injected into the cupola at a point just above the melting zone. This is done at a position where the coke and limestone, solid metal and other materials which complete the makeup of the charge will obstruct, and prevent the ejection of the borings from the cupola caused by upward flow of gases from the combustion zone.

Cast iron borings enter the melting zone immediately and are heated rapidly to their melting point and merge with the molten metal and slag produced from the solid

TABLE I
BEFORE AND AFTER USING SWARF MELTING PROCESS

	Pig Iron (Tons)	Bought Scrap (Tons)	Steel Scrap (Tons)	Foundry Scrap (Tons)	Cast Iron Borings (Tons)	Total Melt (Tons)
Before using C.I. Borings....	85	6	29	80	..	200
After using C.I. Borings.....	68	..	12	80	40	200
Weekly Saving	17	6	17	..	..	...

TABLE II
ANNUAL SAVING (FIFTY WEEK PERIOD)

Pig Iron	850 tons	@ $36.40	per ton	$30,940
Bought Cast Iron Scrap	300 tons	@ 20.40	per ton	6,120
Steel Scrap	850 tons	@ 21.56	per ton	18,326
				$55,386
Less Cast Iron Borings	2000 tons	@ 9.80	per ton	19,600
Net Annual Saving				$35,786

metal charge. This cuts to the minimum the period when oxidation of the swarf and sulphur absorption may take place.

The borings are carried into the melting zone of the cupola as melting proceeds by the force of the injection, and the movement of the charges of metal, coke and limestone down the cupola. They increase the amount of metal melted by the weight and proportion put into the charge as there is practically no loss in melting process.

Melting Rate Stepped Up—Results indicate that when the Croft process for reclaiming borings is used the melting rate of a cupola is increased. Also casting metal temperatures are reached with a reduced coke to iron ratio due to improved furnace thermal efficiency.

With the ram operating at maximum speed, it is possible to push into the melting zone nearly 2500 pounds of swarf per hour. A rate employed on the 36-inch internal diameter cupolas at Crofts plant in England is about 2000 pounds per hour for a charge-iron melting rate of 4 tons per hour. This corresponds to a metallic addition of 25 per cent to the solid charge.

Metal Composition—The cupola mixture, says Mr. Croft, is calculated in the usual manner. Allowances are made for introduction of swarf as a constituent of the charge.

Losses of all constituent elements are similar to that experienced under normal melting practice. Operation of the feeding apparatus used for the swarf addition also enables ferro alloys to be added effectively, if required.

The basic iron is adjusted to suit casting cross sectional thickness by inoculation with graphitizing agent at the cupola spout. The new process also eliminates high sulphur absorption found when borings are melted in cupolas using other methods.

Melting loss in any cupola is dependent on the nature of the pig iron and scrap used. In the new process of melting cast iron borings, no extra losses above those normally experienced are found. Under normal conditions these should not exceed 3 per cent.

Economic Advantages—An iron foundry in England now using the process has two cupolas of 54 inches outside diameter, lined internally to 36 inches diameter. They are worked on alternate days, and the metal is used for general engineering castings varying in weight from a few pounds to about 300 pounds.

Output of the foundry is about 120 tons of finished castings per week. The weekly metal requirements to produce the above tonnage, before and after installing the new melting process is shown in Table I. Table II shows the savings made in a 50-week period.

Savings shown are associated with a corresponding reduction in the consumption of pig iron, bought scrap and steel. This leaves a balance of available supplies to provide the basis for an additional annual production of 2500 tons of in-ladle metal. The saving represents an economy of 33⅓ per cent in the consumption of pig iron, bought scrap and heavy steel.

Unloading Flammables Safely

Manufacturing Chemists Association Inc., announces publication of a revised manual sheet TC-4 to cover unloading flammable liquids from tank cars. Revised manual brings up to date standards adopted in 1942, detailing safety precautions that should be observed by personnel preparing various types of cars for unloading.

It contains Interstate Commerce Commission regulations, plus references to local and state requirements with which consignees should be familiar. Illustrations are employed to clarify instructions in the text material.

ASTM SPECIFIES

Steel Piping Materials

LATEST FORM for 56 carbon and alloy steel pipe and tubing specifications, including stainless, is published by American Society for Testing Materials. Edition is sponsored by committee A-1 on steel.

Materials covered include pipe used to convey liquids, vapors and gasses at normal and elevated temperatures; still tubes for refinery service; heat exchanger and condenser tubes; and boiler, superheater and miscellaneous tubes.

Many Additions:—The volume is more complete through addition of casting, forgings and welded fittings, bolts and nuts used in pipe and related installations. Another part of the book contains the society's standard classification of austenitic grain size in steels with two sets of charts. To complete the project, American standards are listed covering wrought steel, iron and stainless steel pipe.

New specifications cover seamless and welded steel pipe and tubes for low temperature service; seamless ferritic alloy steel pipe for high temperature service; forged or rolled carbon and alloy steel flanges, forged fittings, valves and parts for low temperature service; ferritic and austenitic steel castings for high temperature service; and ferritic steel castings for pressure containing parts for low temperature service.

Alternates Listed—Several emergency alternate provisions applying to specifications in this compilation have been approved and included in the volume.

These alternates are issued by the society in accordance with a special procedure to expedite procurement or conserve materials.

Pickup prod and stroboscopic lamp used to check lathe for frequency and amplitude of vibration making the elimination of unbalance an easier job

Lathe Vibrations Pinpointed

Time savings with electronic detection equipment of great importance with pressure for delivery of machine tools at peak due to defense requirements

DETECTING and eliminating vibration in a machine tool are important final checks before shipping it to a customer. Vibration amplitude testing and balancing of individual components have long been part of inspection at Monarch Machine Tool Co., Sidney, O., but until recently success depended on the individual skill of a few experienced men.

Ability to detect unwanted vibrations not only is possessed by few men but the narrow permissible limits make the operation time consuming. Man-days of checking, balancing and rechecking are required to reach the desired perfection.

Cumulative Error — Rotating parts are dynamically balanced as separate components but it's still a big problem to achieve the overall degree of balance required after all components are assembled in the finished machine. Operated together, parts which by themselves balance satisfactorily, are sometimes prone to develop a cumulative unbalance sufficient to require correction. Precision and delivery requirements combine to make time savings critically important.

Solution to both problems lies in the use of an electronic device manufactured by Lion Mfg. Co., Columbus, O., that combines in a single, portable instrument all the equipment needed to pick up and isolate vibrations causing unbalance in a newly assembled lathe. Always important, the need for vibration elimination is intensified since more and more Monarch lathes are being supplied with highly sensitive tracer equipment. Vibrations of relatively minute character could be picked up and reproduced in the surface finish.

Speed and Accuracy—Using the vibration discriminator makes possible the literal pinpointing of vibration sources. Each is removed successively to reach the desired amount of balance in a fraction of the time previously required. Perhaps of greater importance is the fact that no special skill or technical know-how is needed to use the equipment. It can be used by the average mechanic since neither a specially developed sense of touch nor previous experience in vibration study are necessary.

Vibration discriminator goes beyond existing dynamic balancing equipment in an ability to measure vibration in terms of how often and how much as opposed simply to where and how much. It was designed primarily to simplify and speed up the process of securing all the necessary information for making a vibration analysis. That the equipment could be used for balancing the individual parts of a machine without their removal from it was only discovered later and has become an invaluable asset for balancing a finished lathe.

Balancing instrument consists of three pieces of equipment: Compact portable case containing electronic tubes, transformers and circuits, and mounting two meters used to measure vibration in terms of frequency and amplitude; a reflector-type stroboscopic lamp; and a self-generating seismic-mounted, velocity-type pickup with special filtering prod complete the balancing equipment.

Several successive checks are made to eliminate the possibility of vibration developing from any combination of accessories on the individual lathe. Operation of the vibration discriminator in making these tests is simple. With the driving motor of the lathe running, the pickup may be rested upon,

fastened to or prodded against the particular part that is under observation.

Versatile Tool—Pickup may be placed vertically or horizontally, depending upon the direction of greatest vibration. The slender metal prod makes it possible to reach into and make contact with otherwise inaccessible surfaces of the machine. Since the pickup is highly directional in its application, determining the plane of greatest vibration and its magnitude are both greatly facilitated.

A low-pass filter takes out the high frequencies caused by electrical pulsations, rough bearings, gears, etc., making possible the segregating of vibration caused by any out-of-balance condition in minimum time. Vibrations in the machine are transmitted by means of the pickup unit to electronic circuits contained in the balancing instrument. These circuits perform several functions: Keep the stroboscopic lamp firing in exact synchronism with the vibration sensed by the pickup, provide (on the amplitude meter) a reading of the peak-to-peak inches of linear displacement and register (on the frequency meter) the speed or rate of occurrence of this vibration.

Four-in-One—Power supply for the instrument is designed to eliminate undesirable coupling between its different functions; and can actually be considered as four separate power supplies: To supply plate voltage for the strob channel, to supply plate voltage for the amplitude channel, to supply plate voltage for the strob tube itself and to supply the required bias voltages in the circuit. Each is individually regulated and to all intents and purposes is completely independent from the others.

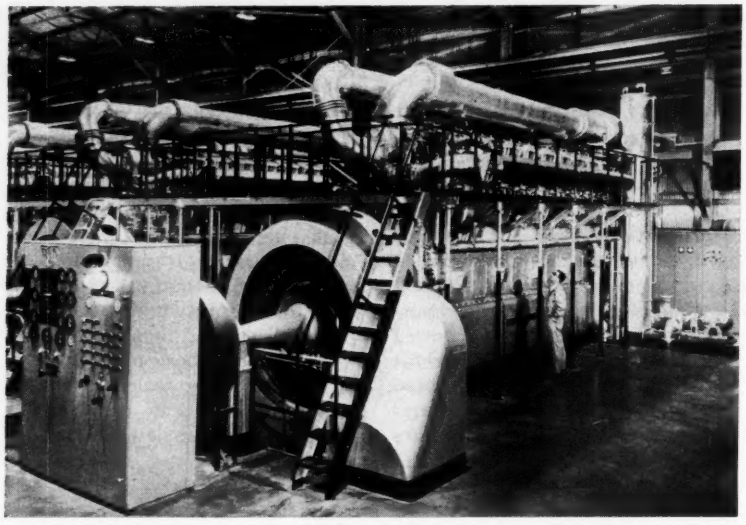
Angular position of the unbalance in the part being checked is determined from the phase angle obtained when the part is, in effect, made to stand still through the optical illusion created by the intermittent flashing of the stroboscopic lamp.

Having thus visually determined which part is causing the greatest vibration, it can be replaced (as in the case of a belt) or balanced (as in the case of a sheave) and further checks made for the smaller sources of vibration which are then progressively eliminated. With the exception of belts which generally have to be changed to eliminate vibration difficulties attributable to them, it is usually possible to correct an unbalance in other components right on the lathe for whatever range of operating speeds is concerned.

Variable Factors—Exact angular position of the unbalance force will vary with the overall mass, the fashion in which the part is mounted and the amount of unbalance. For any lathe part of the same mass and dimensions and similarly mounted, it is Monarch's experience that the angular force will be recorded in essentially the same angular moment after the critical speed of operation is exceeded.

To determine this angular moment for a given lathe part, the procedure is to create a known unbalance by the addition to the part of a known weight. A trial run will then establish the approximate angle and the amplitude reading will record the displacement resulting from this known weight of unbalance.

Having determined the approximate angular location from the stroboscopic lamp and the force required to produce the recorded amplitude, the permanent physical corrections are made by adding weight at X or removing weight at Y. Successive trial runs will then permit the refinement of balance to any required degree.



Self-Generated Power for Aluminum Production

Nine of these Cooper-Bessemer engines power all electrically-driven machinery, equipment and lights at the aluminum reduction plant built by Reynolds Metals Co. near Corpus Christi, Tex. This group is identical to 33 others installed in another building to power one of two pot lines. All are 16-cylinder supercharged engines burning straight gas. In the group of 33, each drives a 2500-kw, 720-v dc generator; each of the nine drives a 2500-kw, 4160-v ac generator

Ring-Joint Sizes Standardized

Duplication of ring sizes for ring-joint gaskets and grooves for steel pipe flanges has been controlled. This development is announced by a committee organized under procedure of American Standards Association.

Committee established an American standard correlating sizes. Joint sponsors, are American Society of Mechanical Engineers, Manufacturers Standardization Society of the Valve & Fittings Industry and Heating, Piping & Air Conditioning Contractors National Association.

Ring joint gaskets and grooves were developed to their present form principally by the oil industry. Thus, the new standard (ASA B16.20-1952) was prepared in cooperation with American Petroleum Institute and incorporates several standard specifications.

Ingersoll-Rand ANGLE WRENCHES

get into tight spots with ease

FOR NUT-RUNNING JOBS UP TO ¾" BOLT SIZE! I-R Angle Wrenches are amazingly powerful Air Tools, light in weight for easy handling. These handy air-operated Angle Wrenches are designed solely for fast nut running in confined locations where the use of other types of nut runners is impossible.

107 *Models*

STALL TORQUE
1.8 to 83 ft. lbs.
(at 90 psi air pressure)

HEIGHT OF ANGLE HEAD
1-3/16" to
3-11/16"

720-8

[redacted] Angle Wrenches Licked This Tough One!

A really mean close-quarter job on an automotive assembly line took its toll of 12 angle wrenches in 1 week's time—An Ingersoll-Rand air powered Size 18L was put on this job and gave uninterrupted production for 3 months.

GET COMPLETE DETAILS
on these compact air angle wrenches promptly from

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COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS
CONDENSERS • CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

BLAST FURNACE PRACTICE

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operation
Cleveland

Beneficiation of Air—XI(a)

Factors that influence the value of dry and moist blast on furnace operating economy and the relationship between high pressure blowing and raw materials are explained

MAKING more heat available in blast furnace bosh and hearth operation by removing water vapor contained in natural air before blowing it into the furnace is eminently correct, but numerous applications of it indicate that the economic value of the principle to operating economy is determined by operating conditions under which it is applied. In this respect it is similar to some other blast furnace operating principles in that opportunity for their successful application retires to obscurity or rises to prominence as operating conditions vary. Dissociation of moisture carried into the furnace with air is effected with the reaction, $H_2O + C = H_2 + CO$, $-$ 2868 Btu/2/3 H_2O_4, and therefore, heat is consumed in the furnace hearth which otherwise would be available for iron smelting and slag forming purposes.

James Gayley[15] was first to conceive the use of the dry air principle in blast furnace operation and first applied it to the actual operation at Isabella furnace, Pittsburgh, in 1904. His discussion of the principle and results obtained were presented to the industry in a paper read before the American Iron & Steel Institute in 1904, and later before the American Institute of Mining & Metallurgical Engineers in 1905. At the time, according to Johnson[1], Gayley's conception of the principle, and the results obtained from its practical application, were received with skepticism or outright disbelief by many furnace operators. Although Gayley's conception and practical results assured Johnson of the correctiveness of his own 2-thermal equation theory, his theory was accepted by many contemporary furnace operators as an explanation of Gayley's results.

Personnel Reaction—The foregoing differences in mental processes are cited to emphasize the effect which the complex nature of blast furnace operation can have on the minds of personnel actively engaged in the industry. Most blast furnace operators are deeply engrossed in exacting demands of the specific operation they are directing, and this perhaps explains their reluctance to accept, or recognize, the effects of other operating conditions which differ from their own. Many of the operating complexities involved in blast furnace operation can be seen to better advantage in retrospect than in close proximity.

The era in which Gayley conceived his dry air principle was prolific in the development of new practice methods and equipment for the American iron and steel industry. Part IX(a) of this series dealt with the historical review of furnace practice methods, transition in fuels from charcoal, anthracite, and block bituminous coals, to bituminous coke; from local iron ores to Lake ores; and the development of the basic open-hearth process for producing steel. These items are again cited because they had direct bearing on the practicality of applying the dry air principle to blast furnace operation.

As stated in the historical review, the use of Lake ores not only permitted but also required faster blowing than was necessary for local lump ore, in order to deliver the required volume of heat to the shaft operation. Also, because of the chemical composition for iron to be used in the basic open-hearth it was general blast furnace practice to run basic slag. Slag having basic chemical composition requires great concentration of heat in the bosh and hearth in order to maintain the critical hearth temperatures, but with this there was also a need for additional heat in the shaft operation. It was an easy matter to supply shaft needs simply by increasing the blowing rate but in so doing heat was taken from the bosh and hearth, where sacrifice could not be afforded. With conditions described bosh and hearth operation would be the limiting factor for furnace productive capacity. Increased stove capacity for heating the blast, and/or Gayley's dry air principle, were means for supplying additional hearth heat.

Increased Hearth Heat—When blast furnace practice of producing basic iron with acid slag came into use a reduction in the amount of heat consumed by slag increased the available hearth heat and there was sufficient to supply the needs of the bosh, hearth and the shaft, so that lower blast temperature had to be used. With the described change in operating conditions the preparation capacity of the furnace shaft became the limiting factor for the furnace productive capacity and this continued

Lee Wilson

ANNEALING FURNACE DATA SHEET

NUMBER FOUR

BASIC ADVANTAGES OF LEE WILSON SINGLE-STACK PORTABLE BASE FURNACES:

1. BETTER QUALITY
2. HIGHER PRODUCTION
3. LOWER FUEL COSTS
4. LOWER FIRST COST
5. LOWER MAINTENANCE
6. LOW HANDLING COSTS

PORTABLE BASE FURNACE MINIMIZES INSTALLATION COSTS

The new Lee Wilson Portable Base Single-Stack System is the most efficient method of coil annealing available today.

Fewer units are required, no expensive basements or under structures are needed, smaller cranes and lighter building construction can be utilized and less floor space is required.

Because of the larger radiation capacity of a single-stack furnace it will produce roughly twice as much tonnage per stack as multiple-stack units. Thus fewer units are required to produce a given tonnage.

THE ONLY PORTABLE BASE—

The Lee Wilson Portable Base is truly portable and easily handled by light crane equipment. By simply breaking three connections the base can be picked up and taken to a maintenance station for any necessary work. This eliminates the large basements required for repair work by furnaces other than the new Lee Wilson.

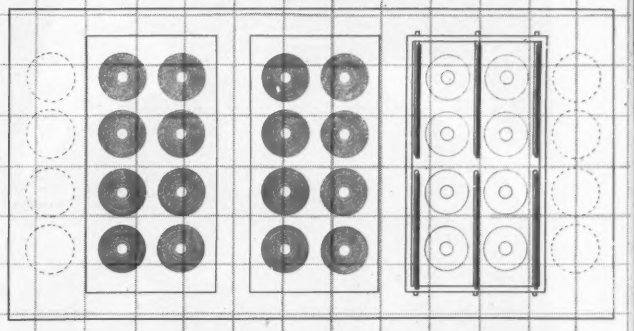


Fig. 1 Floor space, too, is conserved. Due to faster heating and cooling and better load factor obtainable by employing the Lee Wilson Portable Base Single-Stack System—fewer furnaces are required. Thus less floor space is needed for a given tonnage.

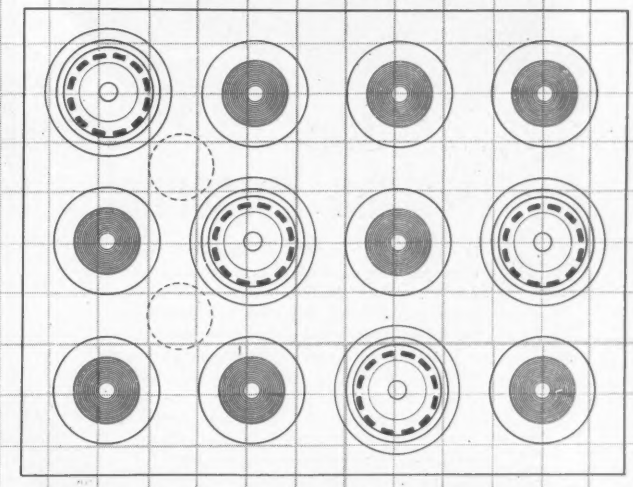


Fig. 2 Additional space for inner cover storage is unnecessary. Inner covers are stored handily between furnaces (Figs. 1 & 2) and only one inner cover need be handled in a charge change.

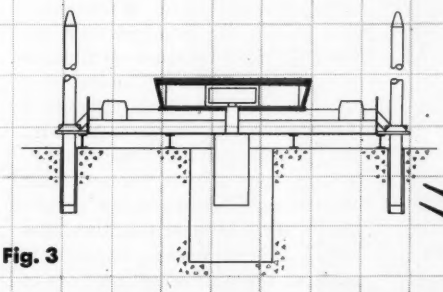
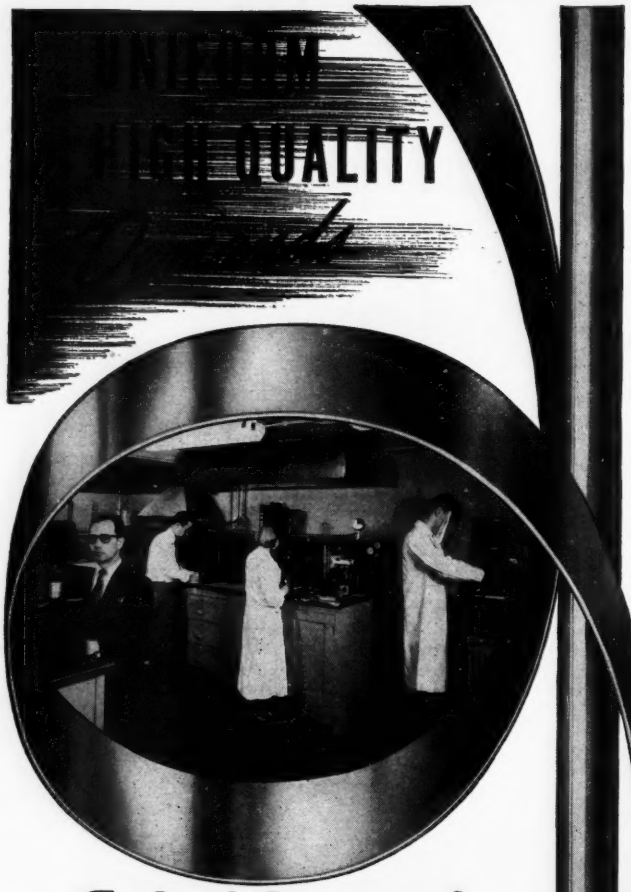


Fig. 3

The Lee Wilson Portable Base Single-Stack System is today's most efficient annealing process—*write for fully illustrated booklet* that completely explains this amazing new idea of sheet and strip coil annealing.



Trained Personnel

In recent years, automatic machines have been developed to a point where it is sometimes said they can "almost think". However — despite this mechanical progress, there is still no satisfactory substitute for trained and experienced craftsmen in manufacturing a product where uniform high quality is the primary consideration. Nowhere is this fact better realized than at Wallingford. In our production departments and our research and test laboratories, craftsmen and technicians exercise their knowledge and skills to maintain the Wallingford reputation for superior quality strip and tubing.

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WALLINGFORD, CONNECTICUT, U. S. A.

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to be the ruling factor in most soft ore furnace operations to the present era.

With the described development in blast furnace practice methods the practical value of the dry air principle was forced into obscurity without in any way destroying its correctiveness. It remained in obscurity until recent years when it was revived with beneficial results in a few operations where conditions were favorable to its use, namely, the production of high-silicon grades of iron with light ore burdens. In these operations hearth and bosh smelting capacity was efficient in relation to the shaft preparation capacity. But where attempts were made to apply it to unfavorable operating conditions, such as the production of low-silicon grades of iron with heavy ore burdens, and where shaft preparation capacity was deficient in relation to the bosh and hearth smelting capacity, it failed to show a benefit.

In addition to the basic blast furnace operating principle, which governs the practical value of the dry air principle, namely, the relation of shaft preparation capacity to the bosh and hearth smelting capacity, there are other factors which influence its value. The amount of heat required to dissociate a pound of moisture contained in air blast will be the same in all furnace operations, but the degree of effect on the furnace operating economy from moisture dissociation will be determined by the number of pounds of moisture entering the furnace per ton of iron and not by the grains of moisture per cubic foot of air entering the furnace. This difference has been illustrated in the comparison of thermal balances in Part II.

Adjustments Are Made—Further means for counteracting the effect of blast moisture on furnace operating economy is illustrated in Table IV, Part V, which shows that the effect can be counteracted with an adjustment in blast temperature so long as there is enough blast heating capacity in reserve to meet the fluctuating blast moisture contents. If blast heating capacity is deficient the burden ratio of ore to fuel must be reduced as the moisture content of the air increases. The data cited also indicate how

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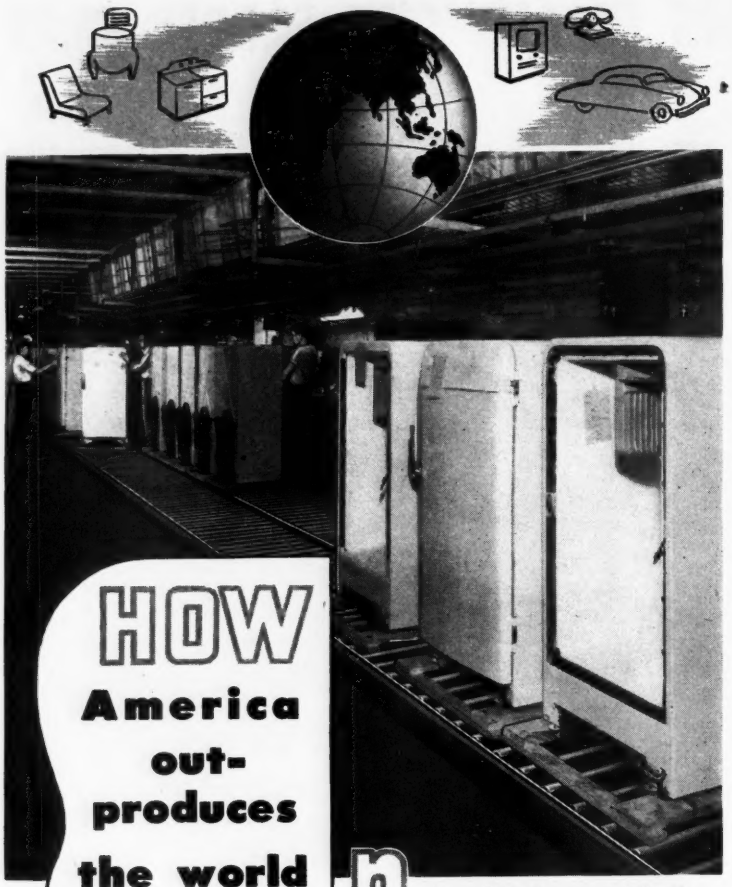

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the slag chemical and mineral composition can influence the effect of blast moisture.

It seems clear from evidence presented that the practical value of removing any part, or all moisture from air blast will be determined by other existing operating conditions, and that there is no justification for it unless other conditions warrant. Comparing operating conditions and thermal effects of blast moisture, as indicated in the thermal balance data for low and high-grade ores, it might be well to emphasize that when ore beneficiation is possible it should be done before air beneficiation, except when warranted by specific conditions, such as the continuous production of high-silicon iron where bosh and hearth smelting capacity is deficient in relation to shaft preparation capacity.

Wet Air Principle—In 1942 J. S. Fulton[16] advanced the wet air principle, the direct opposite of Gayley's dry air principle, and advocated increasing the natural moisture content of air to higher and more uniform content. The theory was based on the fact that a molecule of moisture (H_2O) contained more oxygen by weight than a molecule of air (N_3O) and therefore would burn more carbon and generate more heat. Fulton recognized the certainty of greater heat consumption in the furnace hearth for the dissociation of the added moisture because of the endothermic nature of the reaction, but he reasoned that with a reassociation of moisture components (H_2 and O) in the upper regions of the furnace, the heat consumed in the hearth for the dissociation would be restored to the furnace operation because of the exothermic nature of the reassociation reaction.

Factor Governing the Principle—Theoretically the reasoning can be accepted as correct, providing the moisture components are fully reassociated, but the practical value of applying the wet air principle to furnace operation will always be determined by the *need for the restored heat in the zone of the furnace where it is restored* in relation to its need in the zone from which it was removed. From the premise that most American soft ore blast furnace operations are now sacrificing heat in the

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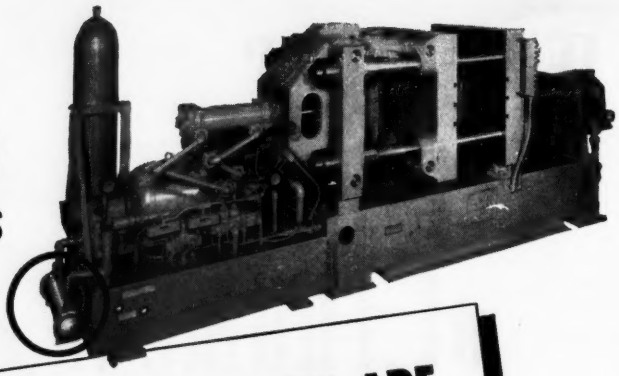

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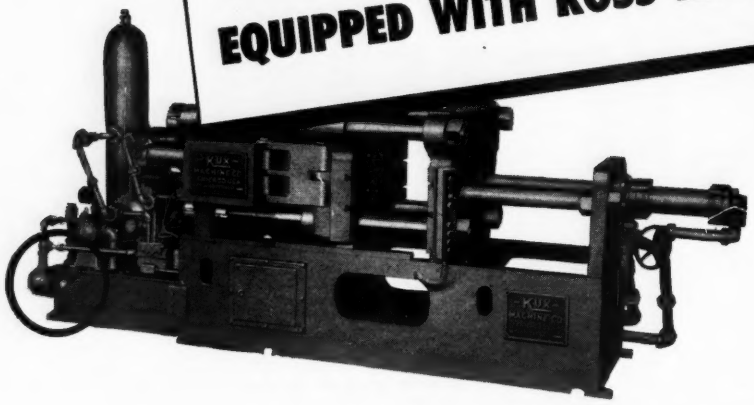

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shaft operation, as indicated by the use of water with the stock to hold down the top temperature in order to get fast stock travel with fast blowing practice, any additional heat generated in the shaft from the reassociation of blast moisture components would simply add to the amount already being sacrificed and therefore it could not have any value to furnace operation. The created thermal affect appears to have the same relation to the shaft operation as additional heat, made available from removal of blast moisture, has on bosh and hearth operation. In both cases if the additional available heat is in excess of the thermal requirements for the division of operation where it is made available, it cannot be utilized, and therefore it does not have any value to the furnace operating economy.

Referring to the thermal balance comparison for illustration, if additional heat had been generated in the respective shafts from the reassociation of the added blast moisture components, the temperature of gas leaving the furnaces would simply have been higher, or more water would have had to be added to stock to hold the gas to the temperature shown, but there would not have been any benefit to shaft operation. The additional heat consumed in the furnace hearth for the dissociation of added moisture, would have been reflected in a higher fuel rate. Actual furnace practice data (Table IV, Part V) showing the effect of wet blast support the theoretical reasoning advanced.

High Top Pressures—In 1938 J. M. Avery[17] advanced the theory of operating a blast furnace with high top pressure, basing his reasoning "on the hypothesis that efficiency and economies in pig iron smelting are measureably and adversely affected by solution loss and that solution loss can be cured by high top pressure."

Avery's hypothesis is an example of the persistency with which Gruner's impossible ideal continues to receive consideration. It seems reasonable to believe that if research data now available for study had been available to Gruner he probably would not have advanced his theory. Failure to effect a cure, or show any effect, on

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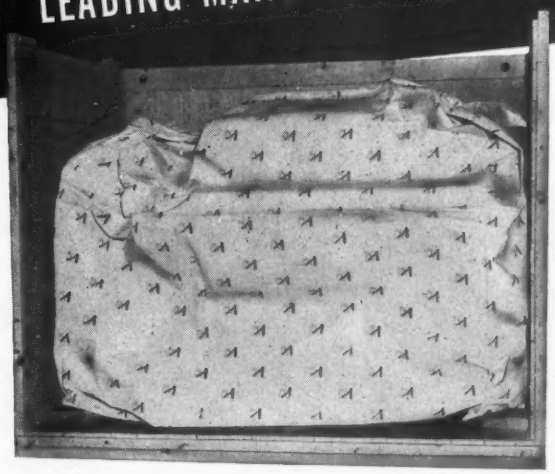

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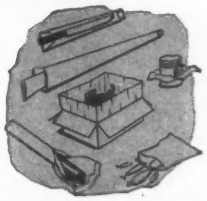

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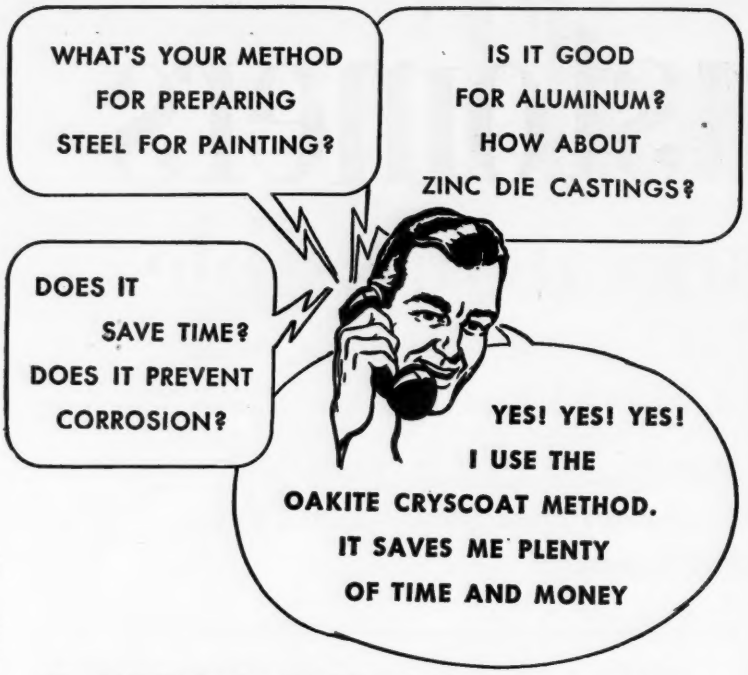
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carbon solution loss when using high top pressure in actual furnace operation at Cleveland and Youngstown furnaces of Republic Steel Corp. substantiates the reasoning regarding solution loss which has been presented in an earlier section of this discourse, namely, that carbon solution loss is a reaction inherent in basic principles of blast furnace operation, and the reaction will occur, due to necessary temperature in the bosh, irrespective of operating practice methods used.

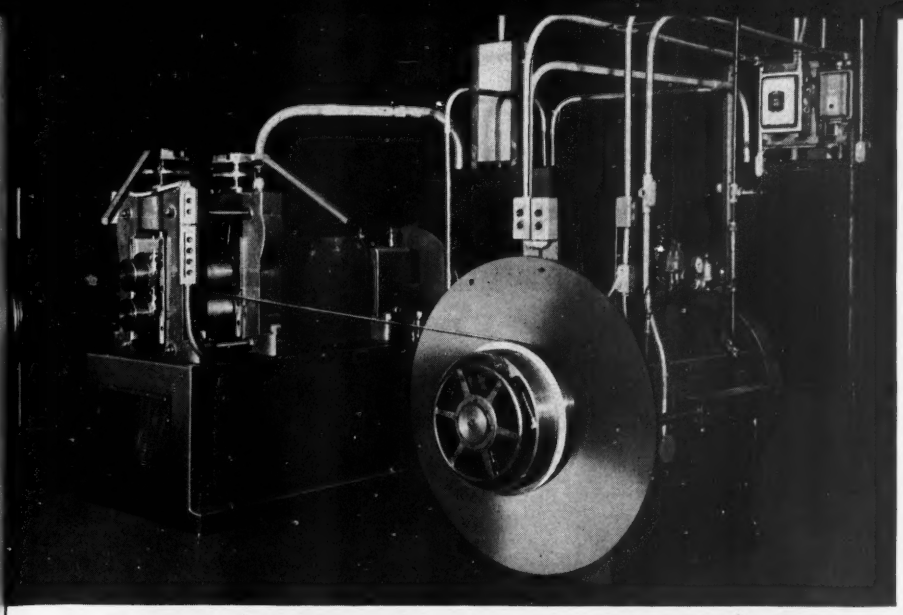
Cites Heat Balances—When describing high top pressure operation Slater[19] presents heat balances "made from the best monthly periods of normal and pressure operations" which show heat consumption per ton of iron by carbon solution loss as follows:

Operation	Btu
Normal	1,035,000
10 psi top pressure	1,060,000

indicating high top pressure did not have any influence on carbon solution loss.

Comparison of factual practice data in Slater's paper, from normal and high top pressure operations, also fully substantiate the discussion of the principles presented in this study regarding the affect of raw material character on blast furnace operating economy. Throughout Slater's comparison, benefits to operation from iron rich sinter and other volatile-free materials, and the ill-effect from high coke ash, is clearly in evidence, with the most economical operation being obtained when volatile-free materials were in the highest percentage of the burdens, and low ash coke was used, indicating these factors had important influence on furnace practice. Since the same influence is indicated with normal top pressure operations used in this study for thermal balance comparison it seems clear a fair percentage of improvement in furnace practice attributed to high top pressure would have occurred anyway under normal top pressure with the same differences in raw materials used.

Using Johnson's 2-thermal equation theory as a basis for reasoning, and the wealth of evidence of its correctiveness which is avail-



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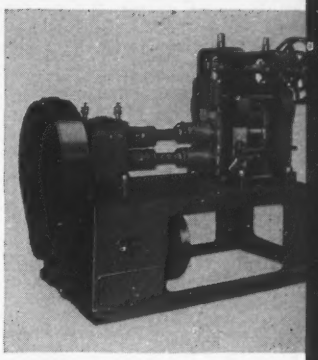

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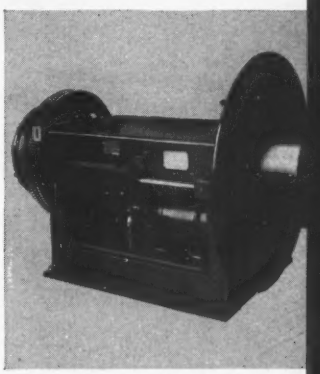

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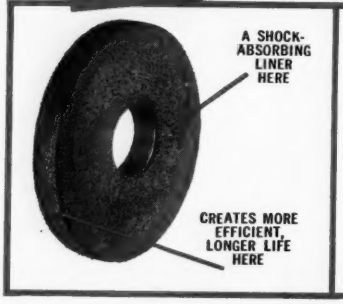
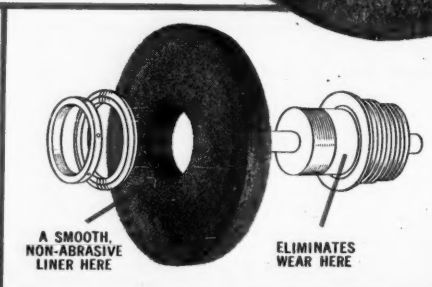
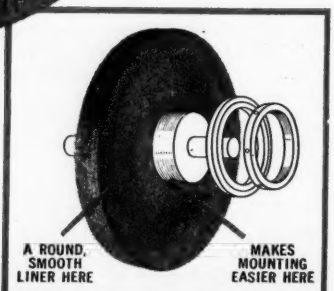


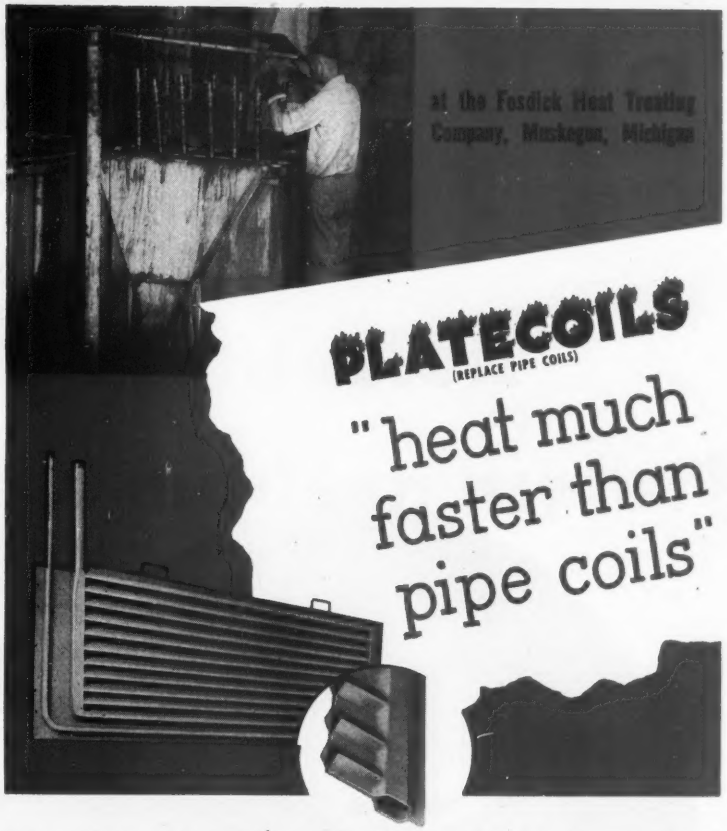




able for study justifies such use, it seems reasonable to say benefit from high top pressure has definite limitations. Possibly, or even probably, more uniform dissemination of heat will be effected throughout the stock column. With reduction in velocity of gas through channels of least resistance in the stock column less flue dust will be produced, which is equivalent to increasing burden weight. Possible further increases in burden weight will be determined by the degree of increase effected in shaft preparation capacity, but definitely, disturbance in relation of capacities between shaft and bosh and hearth divisions of work, and effect of disturbances on furnace operation, will be the same with high top pressure as with normal pressure. It must be recognized that substitution of volatile free burden materials for volatile bearing materials also will increase shaft preparation capacity, therefore, value of high top pressure alone must be judged by benefits conferred with use of different classes of raw materials alone.

How Results Are Obtained— Benefit to bosh and hearth operation will be limited to, and determined by, any percentage of increase effected in the shaft preparation capacity. Consequently, the opportunity for conferring benefit to furnace operating economy will be contingent upon the shaft preparation capacity being deficient in relation to the bosh and hearth smelting capacity, and the greater the variance the greater the opportunity for conferring benefit. From the premise that the thermal requirements per pound of constituents for the respective blast furnace thermochemical reactions are basic and unchangeable in any and all furnace operations, any possible benefit from high top pressure must be from improved application of heat and not from a change in requirements.

The volume of gas in the furnace will remain the same with normal or with high top pressure, only its density and weight will change. The volume of blast can be increased over normal top pressure volume without increasing the gas volume in the furnace, but since an increase in density for any

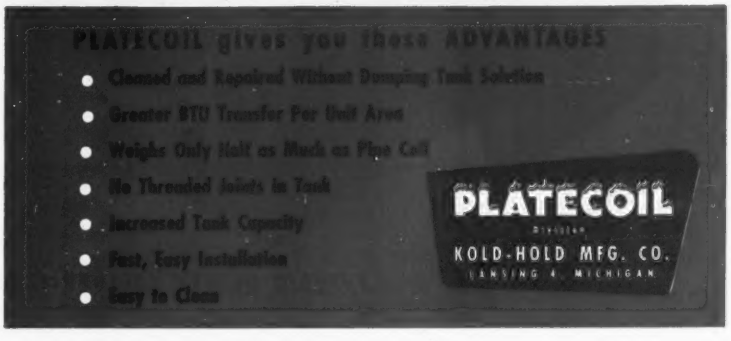

at the Fosdick Heat Treating Company, Muskegon, Michigan
PLATECOILS
(REPLACE PIPE COILS)
"heat much faster than pipe coils"

When Earl Fosdick, President of Fosdick Heat Treating Company, heard about the advantages of Platecoils, he wanted to try them in such a hurry that he flew to the Factory and picked up his first unit. This first Platecoil proved so satisfactory that he ordered a second unit SHIPPED AIR EXPRESS.

Each Platecoil heats a copper plating tank used in the heat treating of cam shafts for diesel engines. The Platecoils heat much faster than the pipe coils they replaced, so it's possible to start plating much earlier on Monday morning after the week-end shut down. In addition, the Platecoils require less space in the tanks giving them more plating capacity.

Platecoils heat faster than the pipe coils because they have more prime surface in a given area. A 22" x 47" Platecoil has the same heat transfer surface as 32 feet of 1½" pipe which occupies approximately 30" x 60" of space. This means better than 50% savings in space and material, and results in a lower initial cost.

Platecoils' faster heating coupled with their unusually low maintenance costs provide savings that are too great to be ignored. It costs nothing to see what Platecoils will do for you. *Airmail your request today for your copy of bulletin No. P72.*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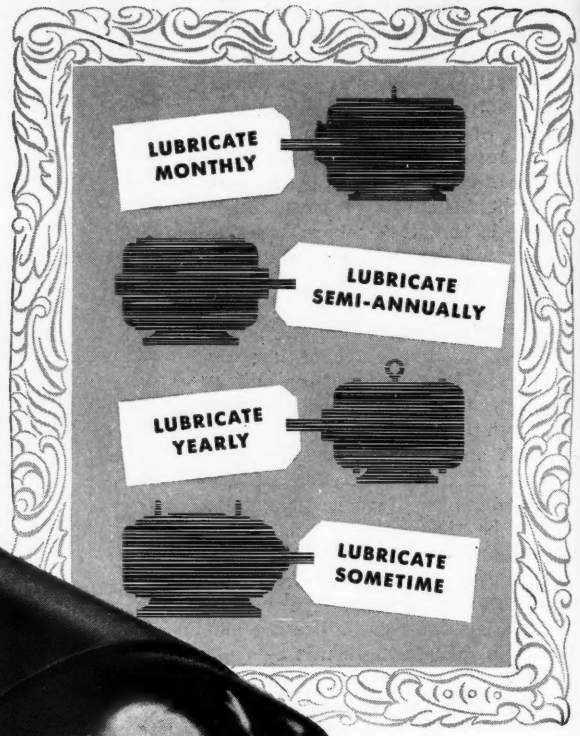

WHAT *Life-Lines* REALLY DELIVER IS MORE SERVICE...LESS SERVICING

Eliminate "lubrication confusion" with this modern motor!

Some motors require lubrication monthly, others yearly, still others have no definite schedules. They "just need it when they need it". It takes no great stretch of the imagination to see that schedules for greasing under these conditions pose a real problem. How can you do an accurate job? How do you eliminate overgreasing or undergreasing? In short, how do you eliminate these causes of failures?

One sure way: install modern *pre-lubricated* Life-Lines. Throw your schedules and grease guns away. The way to grease a modern motor is don't! Pre-lubricated Life-Lines *need no* further *lubrication.*

Records of over half-a-million motors, operating in every type of industry, show that pre-lubricated bearings offer 41% fewer motor outages due to faulty lubrication and at the same time give complete freedom from lubrication attention.

Today periodic lubrication is a costly, time-consuming nuisance. So why take a chance with it? Life-Line offers positive lubrication at no extra cost. See for yourself. Ask your Westinghouse representative for a copy of "Facts on Pre-lubricated Bearings", B-4378, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21694

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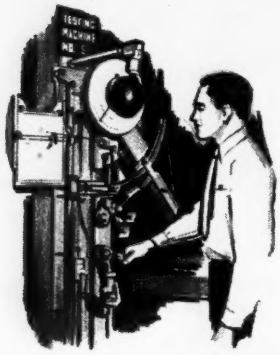

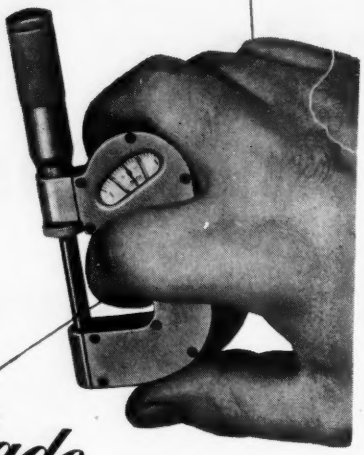

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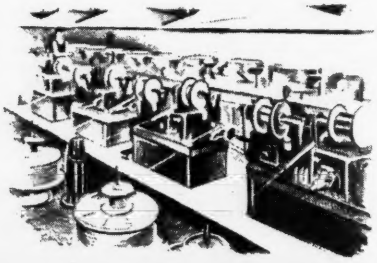

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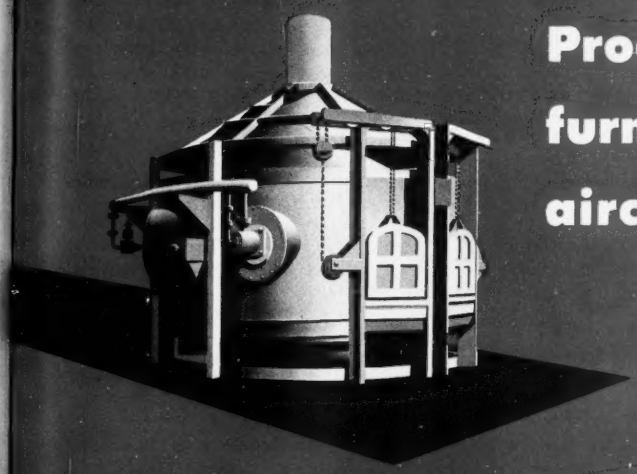
given volume will increase its weight, the thermal requirements for the gas leaving the bosh, and later leaving the furnace (top gas), will be increased in proportion to the increase in weight.

Data from actual furnace operations, presented earlier in this discourse, indicate how gas velocity through the furnace shaft can be increased or decreased due to temperature conditions in the upper bosh, caused by slag mineral composition. Therefore, the true value of high top pressure alone cannot be determined until after the opportunity for improvement with normal top pressure has been exhausted. Because of the vital importance of slag chemical and mineral composition to blast furnace thermal conditions and requirements, it is unfortunate that the Slater paper[19] does not include any slag data.

It seems reasonable to say that the benefit to furnace operation from high top pressure can be imparted only to the shaft operation through a better dissemination of heat throughout the stock column and an improved mechanical condition of gas disposal. But the value of such benefit to furnace operating economy is contingent upon the shaft preparation capacity being deficient in relation to the bosh and hearth smelting capacity, a condition which generally prevails in furnace operations using volatile bearing ores (example Lake ores). Where bosh and hearth operation is deficient in relation to the shaft operation (example Eastern magnetic operations) there would not be any benefit from increasing the shaft preparation capacity because the bosh and hearth could not accept it unless more hearth heat was made available—and the same opportunity exists with normal top pressure.

Theoretically it may be accepted that high top pressure can confer a degree of benefit to shaft operation where volatile bearing ores are used, but the economic value of it as a possible means for utilizing lean Lake ores is open to question. Inevitably in any blast furnace operation lean ores will increase the production of slag, which increases the work in both the shaft and the bosh and hearth



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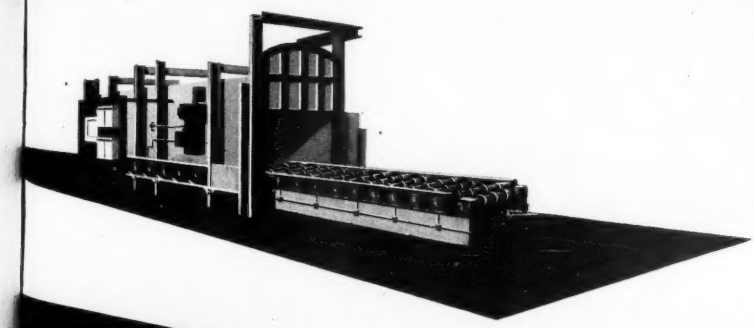

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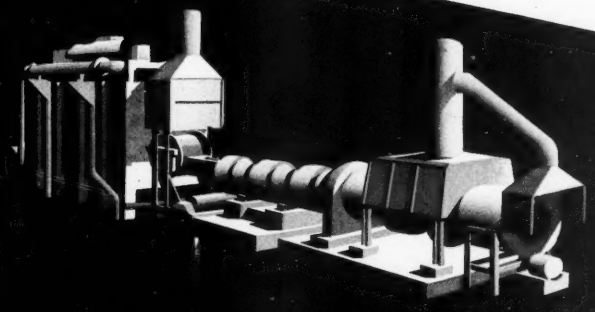

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operations. It seems reasonable that the thermal requirements for increased slag production would adversely affect furnace operating economy to a greater extent than could be compensated for by any possible benefit from high top pressure.

(*To be continued*)

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ISO Topic: Machine Tools

International technical committee seeks world-wide standardization of machine tool elements

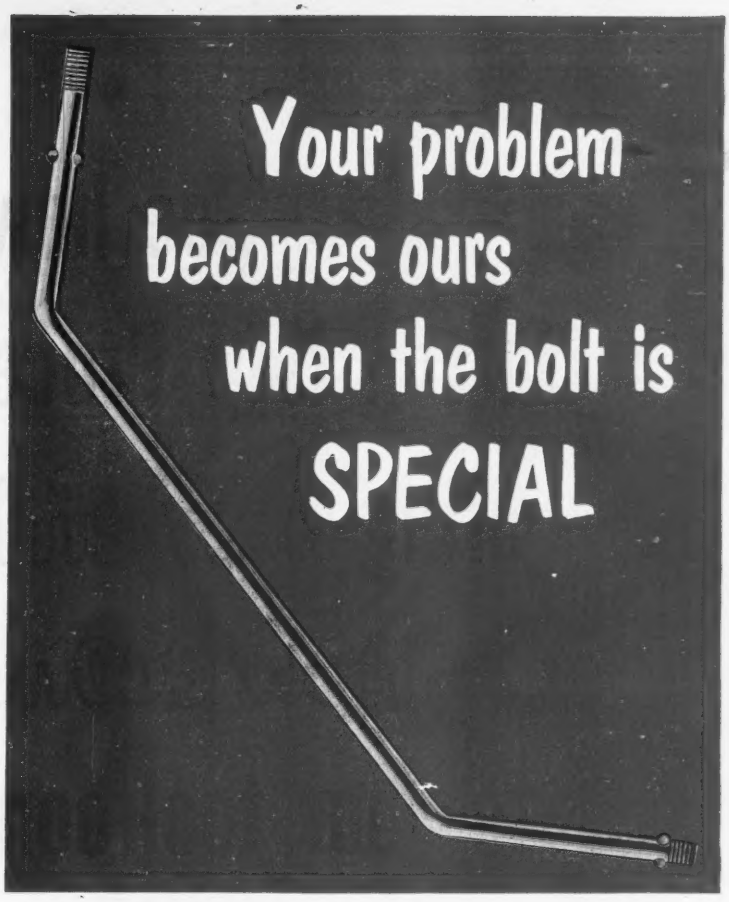
AN INTERNATIONAL technical committee on which 15 countries are represented will meet in New York, June 11-13, to discuss the international unification of standards affecting the design, manufacture and use of machine tools.

The group will meet at Columbia University as part of the second triennial general assembly of the 33-nation International Organization for Standardization (ISO). The American Standards Association, US member of ISO, will act as host at the meetings.

U. S. To Observe—The United States does not participate in the work of the ISO committee on machine tools, but members of the American Standards Association's committee B5, on small tools and machine tool elements, will attend the meetings as accredited observers.

P. L. Houser, supervisor of manufacturing standards research, International Harvester Co., Chicago, and chairman of ASA committee B5, will head the group of American observers.

Among American organizations whose representatives will be accredited by ASA to attend, are the American Society of Mechanical Engineers, American Society of Tool Engineers, Grinding Wheel Institute, Metal Cutting Institute, National Machine Tool Builders'



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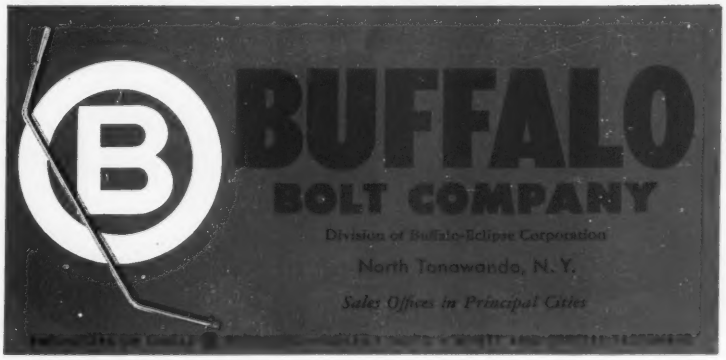

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MOST UNIFORM WHEELS EVER PRODUCED!
Manufactured under constant quality control, Norton *New-Process* Wheels are truly uniform within themselves and from wheel to wheel — unmatched for inherent balance and grinding efficiency in the entire abrasive field.

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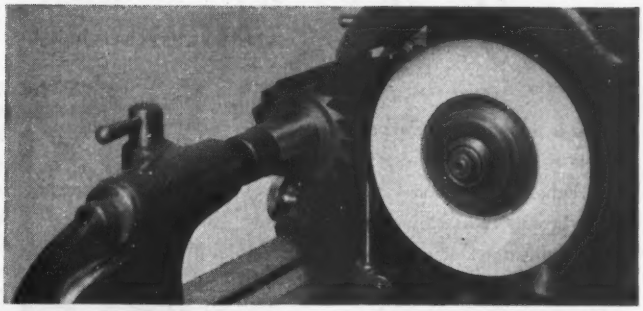

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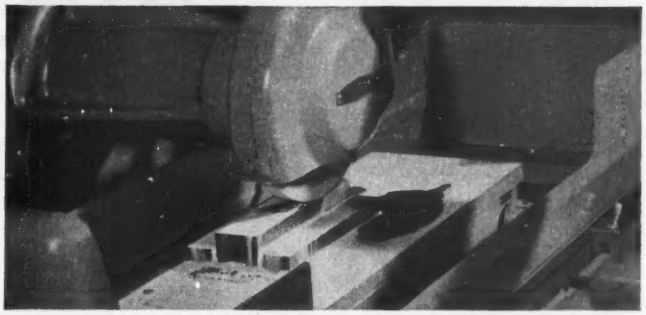

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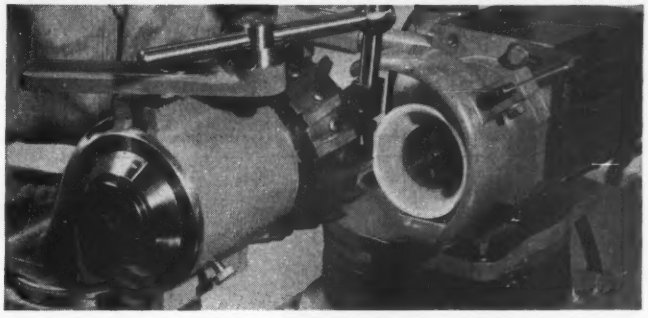

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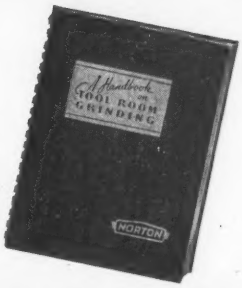
There's no room for guesswork in grinding wheel selection. Your Norton Distributor *knows* which type and size of wheel is best for each job. And if your problems are unusual, he'll call in a Norton Abrasive Engineer for additional expert advice. See him for exactly the *right* Norton Wheel for *any* grinding operation.

162 Pages Of Cost-Saving Facts on toolroom grinding are contained in this booklet. Get a copy from your Norton Distributor or write direct for Form 835.



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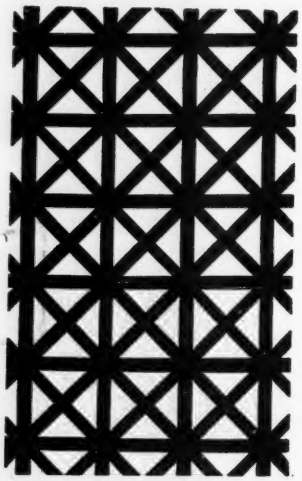
This is a lightweight type of grille especially suited for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers, and similar applications. It is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Hendrick Ornametal can be furnished in a variety of attractive designs, the one illustrated being "Smalcane." Write for full information.



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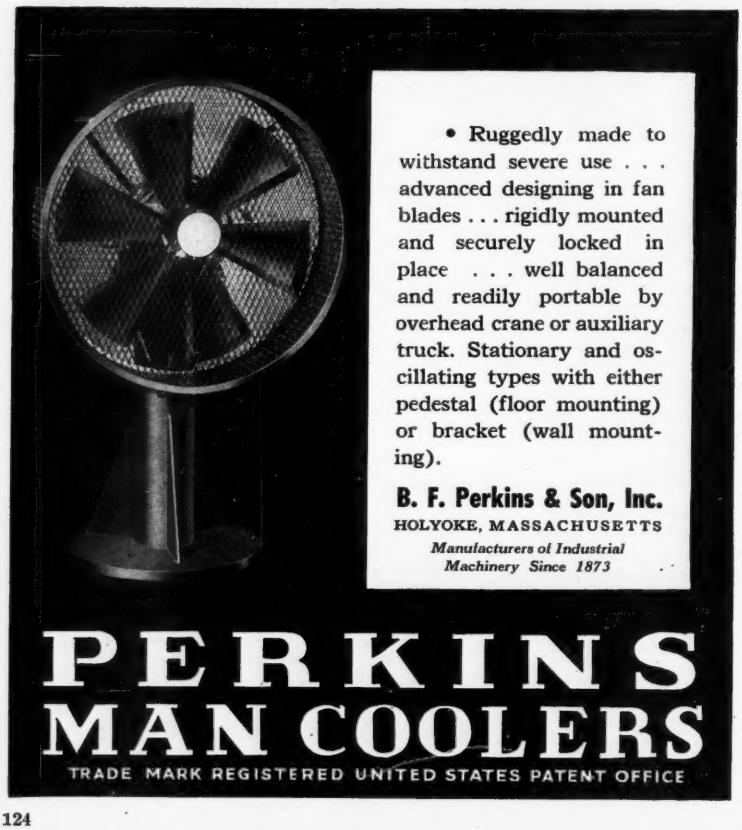

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Association and the Society of Automotive Engineers.

French To Preside—The French national standards body (AFNOR) holds the secretariat of the ISO machine tool committee. Ingenieur-General Pierre Salmon, Commissaire a la Normalisation, Ministere de l'Industrie et du Commerce, will head the French delegation, and preside at the ISO meetings.

Other nations participating in the committee's work are: Belgium, Czechoslovakia, Germany, Hungary, India, Italy, Netherlands, Norway, Poland, Portugal, Switzerland, Sweden, United Kingdom, and U.S.S.R. Eleven more nations, including the U. S., hold observer status.

Topic: Machine Tools—The ISO machine tool committee seeks to achieve international standardization of the elements of machine tool construction and operation, and of tool and work holding elements and associated appurtenances, including the driving mechanisms that make up an inherent part of the machine tool.

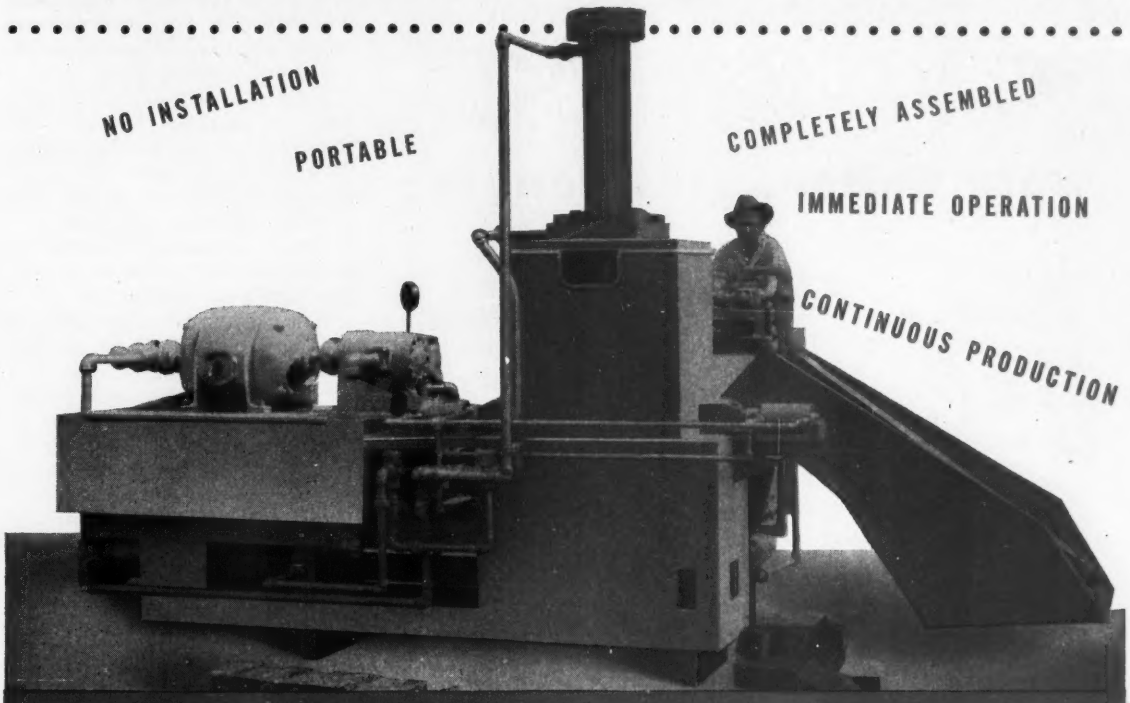
The committee agenda for the June meeting calls for discussion of definitions and measurements, machine tapers, milling machines spindle noses, speeds and feeds of machine tools, lathe centers, T-slots, direction of operation of machine tool drives, tool holders, assembling of grinding wheels on machines, and lathe spindle noses. For five of these twelve items,

Know-How's Force

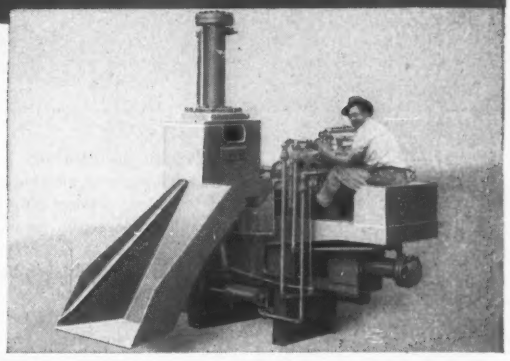
BACK IN 1915, the year that magnesium was born, the metal was sold for $5 per pound. But as American know-how was applied, the price fell steadily. In 1925, for the first time, it dropped below $1, to an average of 86 cents per pound.

In 1915, when the $5 per pound figure prevailed, the U. S. output of magnesium was less than 100,000 pounds per year. Twenty-five years later, in 1940, the annual production was 12,500,000 pounds. By then, U. S. magnesium was selling for about one-twentieth of the 1915 price. Today, the price of domestic magnesium stands at 20-odd cents per pound.

Harris Non-Ferrous Metals Baling Presses



Bundle Size Attracts Dealers and Smelters



The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.

Size of Charging Box	33" x 33" x 24"
Average number of bales per hour	60 - 70
Size of Electric Motor	50-Hp. 1200 Rpm
Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Space Required	10' x 12'
Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE

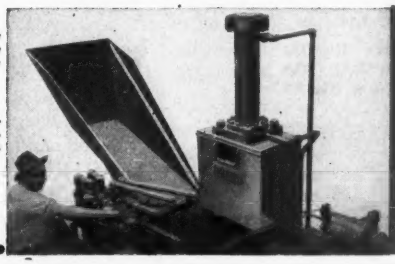
NF-40.....5" x 5" x 15"
NF-50.....5" x 7" x 15"
NF-80.....8" x 8" x 15"

AVERAGE WEIGHT OF BALE

NF-40 .....40-60 lbs.
NF-50 .....50-70 lbs.
NF-80 .....80-100 lbs.

AVERAGE TONNAGE PER HOUR

NF-40 One and one-half tons
NF-50 Two tons
NF-80 Two and one-half tons



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American standards have been established.

No Decisions Yet—The ISO committee held its first two meetings in Paris in 1950 and 1951. It has not yet made any international recommendations on the standardization of machine tools.

According to P. L. Houser, chairman of ASA committee B5, the committee has developed some 25 American standards in the field of machine tools and cutting tools used in connection with them.

Other Committees Involved — Seventy-six ISO technical committees are now working on international standardization projects in such varied fields as plastics, screw threads, agricultural machines, textiles and textile machinery, gears, bearings, laboratory glassware, rubber, shipbuilding details, couplings, fire-fighting equipment and axle heights for machines. Thirteen of these committees will meet during the two week plenary session of ISO in New York this month.

Synthetic Rubber Stabilized

Chemical stabilizer for nonstaining and nondiscoloring synthetic rubber has been developed by Naugatuck Chemical Division, United States Rubber Co.

Chemical, known as Polygard, will find use in pressure sensitive adhesives, chemically blown sponge rubber, wire insulation, rubber products where light colors are desired.

Development is an alkylated aryl phosphite. It gives rubber good heat stability and guards against destructive effects of heat and oxygen during storage and processing, states the manufacturer.

Stabilizer is incorporated with the rubber as an emulsion during the production process. It can be used with hot or cold process rubber and with types of oil-extended rubbers.

NBS Weights, Measures Indexed

Reports of the national conference on weights and measures are indexed and available from National Bureau of Standards in a 45-page booklet. Index covers proceedings published since 1905. For reference ease, material is present-

photograph by d'Arazien

STEELMEN are Canning Fruits and Juices in the Never-ending Search for Better Steel

"Putting up" prunes and fruit juices may seem like an odd occupation for steel technicians. But, at one of J&L's laboratories, where tin plate for food containers is evaluated, canning is one of the many test procedures.

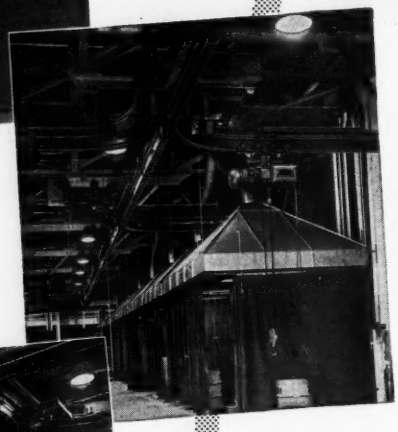
The food is packed in cans made from selected lots of J&L tin plate, thin steel coated with tin, sealed, and cooked at sterilizing temperature. The cans of food are placed in a controlled temperature storage room, where the heat accelerates any action that may be reducing the vacuum within the can.

By measuring the vacuum loss, as it occurs, technicians can estimate what the life of the test cans would be under normal storage. This knowledge helps in controlling the quality of tin plate to make sure canned foods on your grocer's shelf continue to have long storage life.

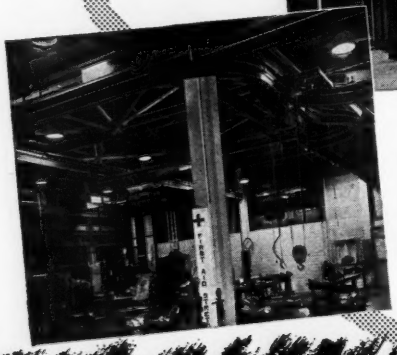
Quality control guides every step in the production of J&L tin plate and other steel products. It combines with research—another of the activities that go on behind the J&L trademark—to assure better steel for every application.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

Railmaster 3-ton crane serves the paint shop area and interlocks via track curve with crane serving the sand blast room. Interlocking track is equipped with opener to allow fire door closure.



Track and switches with spur tracks over welding booths for easy spotting of heavy loads in booths.



Compact track and crane system over the electrical shop area. Note hand chain drop section on extreme left, which lowers a hoist carrier for service or repair.

MONORAIL REDUCES
Maintenance Costs

In this, one of the country's largest maintenance shops, American MonoRail Overhead Handling Equipment serves the entire department. Included in the department are: machine shop, electrical repair, metalizing room, welding, painting and sand blast room, pipe shop, and inside and outside storage. This plant has shown a definite increase in efficiency and a great reduction in handling costs.

Let an American MonoRail engineer show you how you can cut handling costs and save valuable floor space.

WRITE FOR C-1 BULLETIN

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE ● CLEVELAND 7, OHIO

ed in two forms: Subject index and index by names of speakers.

In addition to these two sections, publication includes a list of all conference reports through 1951, indicating which are still available for purchase.

"Swimming Pool" Reactor

New low-cost, low power facility, AEC says, offers training institutions another research tool

SCHOOLS and other research and training institutions now have within their reach another low power nuclear reactor, according to the Oak Ridge operations office of the U. S. Atomic Energy Commission.

Developed by scientists at Oak Ridge National Laboratory, which is operated for the commission by Carbide & Carbon Chemicals Co., division of Union Carbide & Carbon Corp., the low-cost reactor is unique in that it is submerged in water to protect operators.

At Oak Ridge, the unit is the central feature of a bulk shield testing facility which is used for experiments to aid development of improved reactor shields. The facility is referred to as the "swimming pool", since the reactor is submerged in a pool of water 20 feet deep, 20 feet wide and 40 feet long, in which it can be moved.

Cost Low—The entire facility was constructed for less than $250,000, exclusive of fuel. Of this amount, the reactor core itself cost only $58,400, the rest of the cost being for concrete work, the building and auxiliary equipment. The reactor uses fuel elements which had already been designed for the materials testing reactor, a large unit which went into operation recently in Idaho.

This "swimming pool" reactor has a continuous, full load power rating of 10 kw, at which it produces a maximum flux, or neutron density, of approximately 100 billion thermal neutrons per square centimeter per second. It proved to be an economical and safe producer of radiation for certain purposes. For these reasons, as well as low cost, simplicity and performance, it is one of several types which might be suitable for use at research institutions.

What It Is—The reactor is an

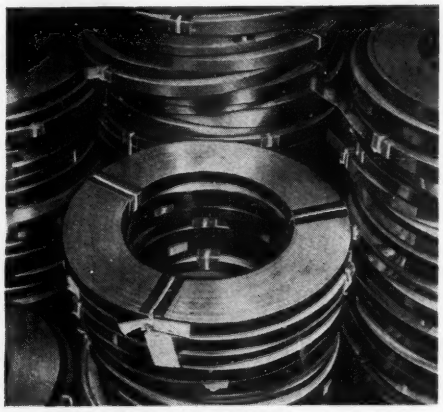
A SAMPLE

OF SANDVIK PRECISION IN SPRING STEEL

Here is evidence of the kind of precision you can get in SANDVIK Swedish spring steel.

In a feeler gauge accuracy is vital. That is one reason why so many makers of these gauges specify SANDVIK cold-rolled, high carbon strip.

In fact, a reputation for close tolerance precision plus fine surface finish has helped make SANDVIK one of the world's largest suppliers of steel for this purpose.



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- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**

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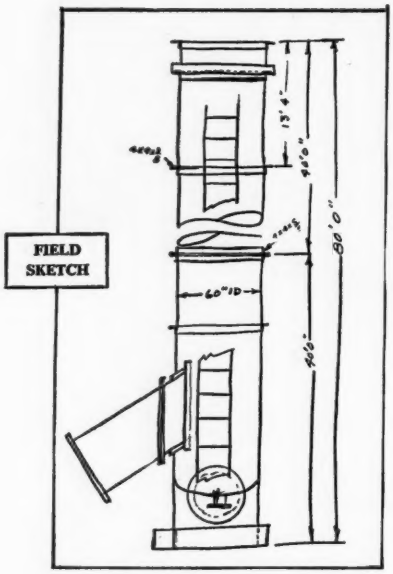
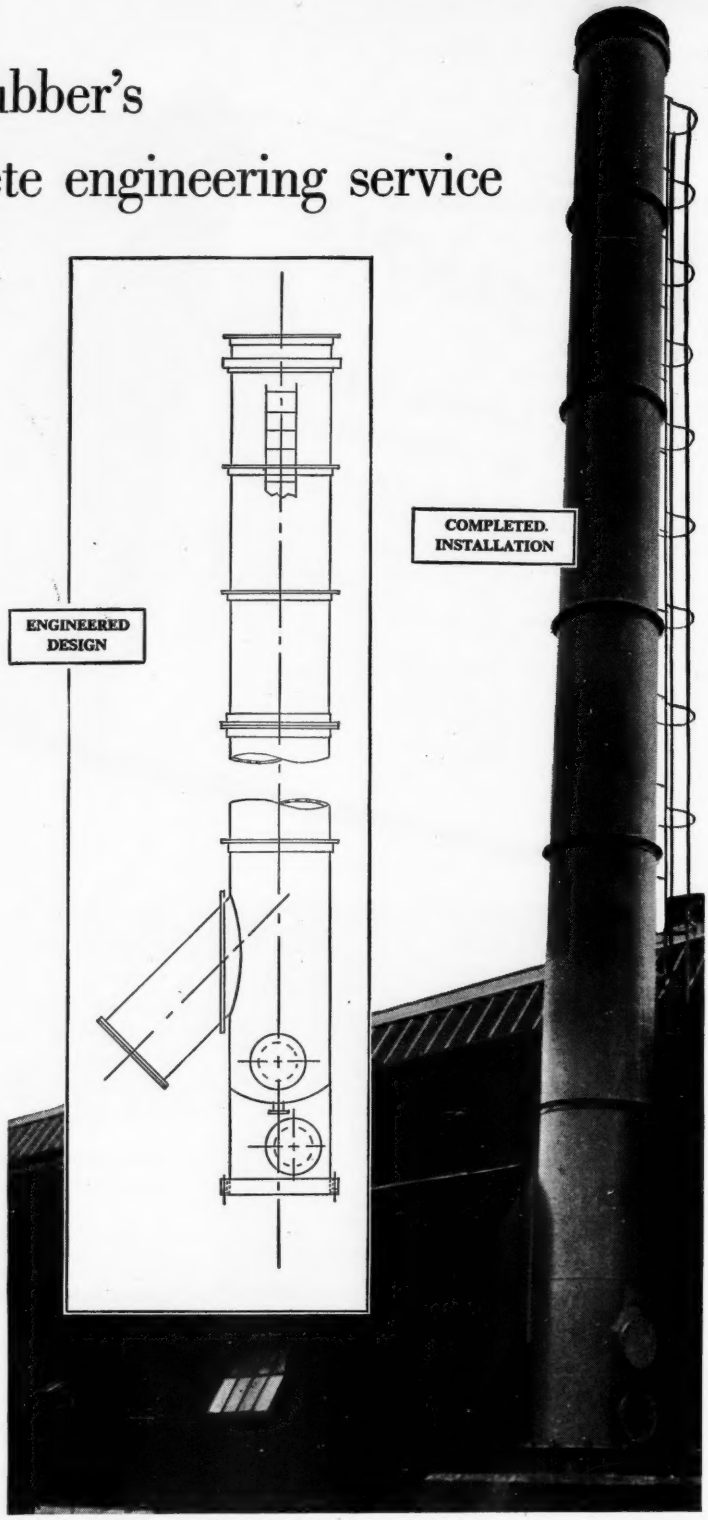
How U. S. Rubber's complete engineering service combats corrosion





This steel mill was faced with the difficult problem of exhausting corrosive gases resulting from its pickling operations. A U.S. Rubber engineer was consulted, and he designed this rubber-lined steel stack. 80 feet high and 5 feet in diameter.

Fabricated, rubber lined and installed under his supervision, its successful operation serves as one more positive example of the complete engineering service available to industry to combat corrosion. Write to address below.

PRODUCT OF U.S.RUBBER SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

assembly of movable fuel elements placed on end in an aluminum grid. It is suspended by an aluminum framework from the reactor bridge which spans the pool. The bridge rests on wheels fitted to rails along either side of the pool, so that the reactor can be moved along a center line the length of the pool.

Similarly, an instrument bridge spans the pool and operates on the rails. A steel framework attached to the movable mechanism of this bridge extends nearly to the bottom of the pool. Using a carriage that slides up and down on the framework, operators can place test instruments at any point in the pool.

Upkeep Easy—A useful feature of the facility is an aluminum gate, 12 feet high and 21 feet long, 10 feet from the south end of the 130,000 gallon pool. When the reactor is moved to this end of the pool, the gate can be lowered and the greater area of the pool can be blocked off and pumped dry. Thus, repairs and adjustments are facilitated, and instruments and shielding samples can be placed easily in desired spots, with personnel protected from radiation.

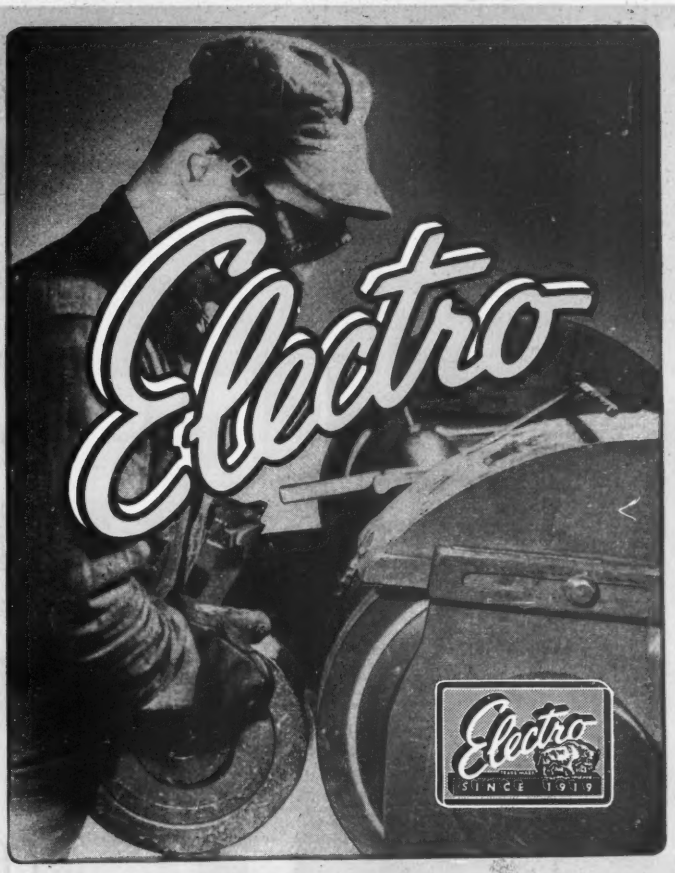
Shielding measurements on sam-

POW Background

THE MECHANICAL prisoner of war — the huge 15,000-ton Schloemann press leased by Alcoa from the United States Air Force, was built specifically for forging aluminum-magnesium aircraft parts such as propeller blades, crankcases and spar sections.

Upon completion, it was installed at the Vereingte Leichtmetall Co., Hanover, Germany, and immediately started production. Although this plant was the target of many allied air raids and was largely destroyed, the press itself was never severely damaged and remained in production to war's end.

The mechanical POW now in Alcoa's Cleveland plant, is made of iron and steel castings and forgings—with bronze used for wearing parts. Component parts of the press weigh 1628 tons. Single castings weigh more than 120 tons, and the 16 nuts that hold the press together weigh 10 tons each.



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Electro's special composition wheels for the specific purpose of grinding any particular metal have repeatedly shown savings on abrasive cost at both vitrified and resin speeds, plus labor savings.

Requirements in grinding wheels become increasingly individual. If the wheel you need isn't made, we'll make it for you. Write, wire or phone for an Electro Sales Engineer to survey your needs without obligation; and send for Grinding Wheel Manual 645 and Speed Calculator. Both free and very useful.

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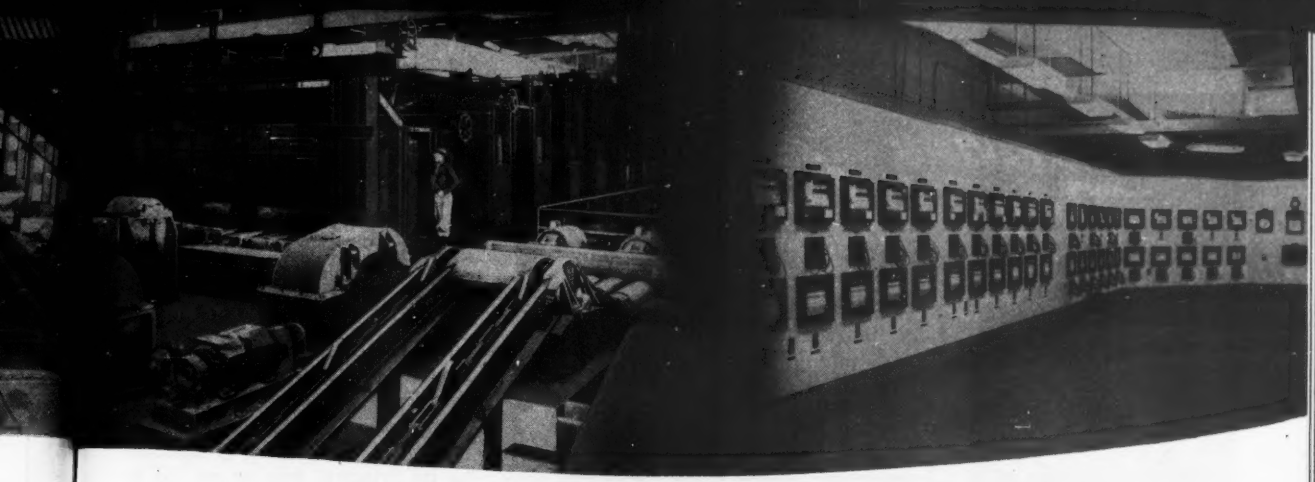

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Tool Saving Tips

No. 5 OF A SERIES

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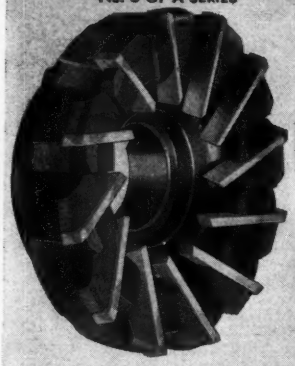
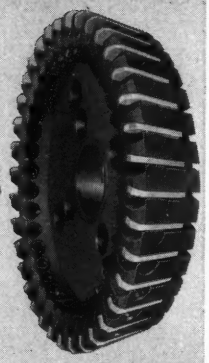


"KF" for STEEL and Heavy Cast Iron Milling

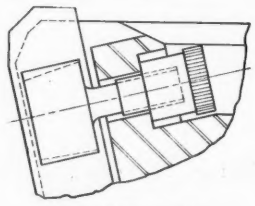
"KF" radial type Kennamill has solid Kennametal blades. For production jobs on steel, and heavy cuts on cast iron. Standard sizes 6", 8", 10", and 12".

"MF" for CAST IRON

"MF" axial type Kennamill has solid Kennametal blades—more per inch of cutter diameter than the "KF"—for high production runs on cast iron. Standard sizes 6", 8", 10", and 12".



Simplify SET UP, DISMANTLING, MAINTENANCE



NEW! ONE PIECE WEDGE AND SCREW

The shank of the stud-type, heat-treated alloy steel wedge extends through the cutter body. The wedge is pulled down, and blade secured, by turning the Allenut — easily accessible at the back of the cutter.

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Blades can be precision set. Wedges and blades for all sizes of each type cutter are interchangeable. For complete particulars, see Catalog 51, and Supplement 2.

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MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

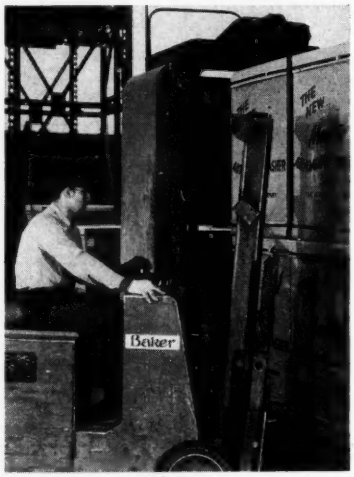
ples can be made also in the open air, with samples placed near the dry side of the gate and the reactor moved close to the other side of the gate.

Centered on the bottom surface of the pool is a well, 14 feet square and 5 feet deep. This is filled with removable blocks of high-density concrete, giving part of the pool an adjustable floor level for more flexibility in positioning shielding samples and instruments.

Its Uses—The reactor has a variety of potential uses in addition to its principal role as an aid in the testing of shields. It enables students and other investigators to perform critical experiments, study neutron distribution and, within limits, study the effects on reactor operation of various patterns of arrangement of the fuel elements.

Operated at full power, the reactor has a flux high enough to make long irradiation periods unnecessary for most experiments. With the neutrons available from this reactor, scientists can study phenomena of short-life beta and gamma radiation, a field which atomic scientists consider fertile.

The "swimming pool" helps also



Look, No Skids!

Forkless fork truck is an idea used by engineers at Maytag Co.'s Newton, Iowa, plant. Metal lip attached to the frame hooks under flaps at the carton tops, and a backplate prevents damage. Design permits stacking without skids and cuts hauling time by about two-thirds. The truck started out as a standard 1500-pound capacity model of Baker-Raulang, Cleveland

THE right TOOL

Every mechanic knows the importance of having the right tool for the job.

In a hand operation, a good man can make up for deficiencies in his equipment by his personal skill and know-how. A machine does not have this skill. The Tool must be right. The men who design and build the tools must have the know-how.

For over thirty years the Micromatic organization has been developing, building, and servicing honing tools. Every Micromatic tool is engineered to give the greatest possible precision and productive life.

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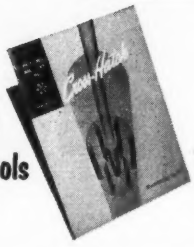

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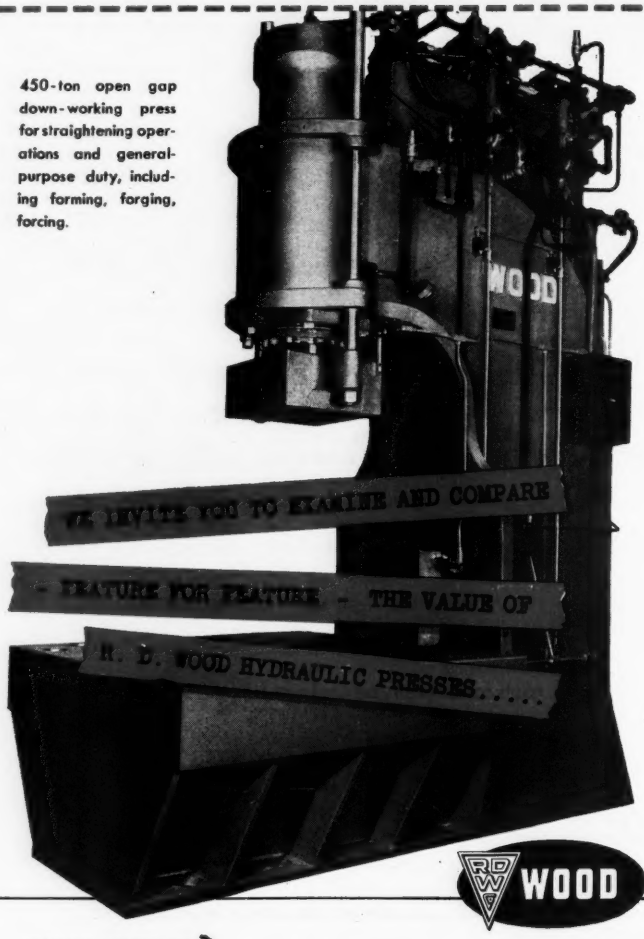
in the expanding practice of chemical analysis by making specimen materials radioactive. In addition, since a neutron beam from this reactor can be collimated—that is, in a sense, focused—with ease, equipment for neutron diffraction research can be used with this facility.

Why Built — The reactor was built to answer a special need for more experimental work on shields. Such work previously was carried on intermittently in a "lid tank" facility. This tank, 7 x 7½ x 11 feet, containing about 5000 gallons of water for shielding purposes, is attached to one side of the graphite-uranium reactor.

The "swimming pool" reactor is housed in a steel-frame building, with corrugated metal siding. The building is 38 feet high, 77 feet long and 51 feet wide. The reactor and its equipment were built in laboratory shops, and the facility is now operated by physics division shielding group.

If it's an **R. D. WOOD** *... It's Good**



450-ton open gap down-working press for straightening operations and general-purpose duty, including forming, forging, forcing.

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Progress in Engineering

GE's McCuen says engineers have become the most vital factor in the U. S. economy

FUTURE of the nation hinges on how well the engineer's creative force is applied to efficient use of men, machines and materials.

This is the summary voiced by Charles L. McCuen, General Motors vice president and general manager, Research Laboratories Division, recently at the Michigan State College engineering exposition. He credits the American engineer with developing the greatest and strongest civilization of all time.

Vital Factor—"The most important single factor in our national economy in the last 100 years has been the rise of engineering," he says. "During these 100 years, engineers have applied scientific discoveries to the problem of giving us an abundant life in peacetime and protecting our country in times of war."

The research executive points out that there were about 40,000 engineers—or one engineer to every 250 workers—in 1900. Today, he adds, this figure has been increased to more than 400,000, or one for every 62 workers. And the trend is still steeply upward.

Greater Power—Present data indicate the U. S. uses half the world's power production and 7 per cent of the population to perform 40 per cent of the total work. Looking to the future, he sees a job for the engineer in making conversion of energy into horsepower hours more efficient.

Mr. McCuen says, "Conversion of energy in fuel to useful power is as low as 10 per cent; seldom over 20 per cent. Much has been said about dwindling fuel resources. Intensive engineering developments could certainly double efficiency in many applications. We could then obtain several times the usable horsepower hours from our present annual fuel consumption."

Practical Problems — Another goal cited by the speaker is the need for cutting down the lag between experimental and practical use. "We are slowly learning to do this in our advanced engineering

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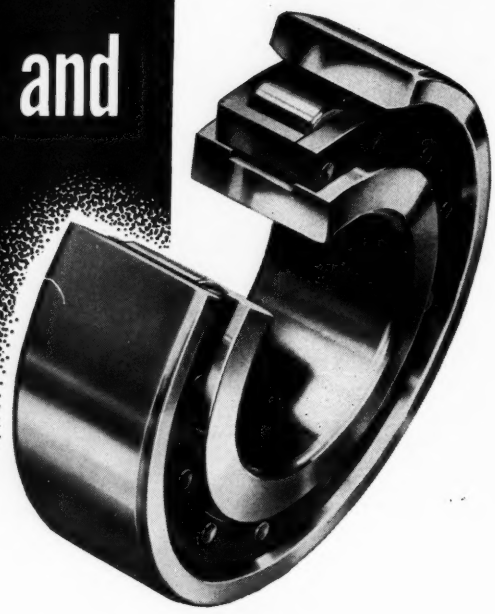

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Like a Baker's Oven

CONTINUOUS type heating furnace employed by an Eastern nonferrous metal mill heats aluminum cakes 7 x 37 x 114 inches at 950 to 975° F at the rate of 10,000 pounds per hour. The unit also is used for homogenizing the same cakes at 1125° F at the rate of about 3000 pounds per hour and a soaking period of 10 hours.

Almost like in a baker's oven, the cakes are laid on a chain conveyor three across and four running lengthwise so there are 12 cakes in the furnace at full capacity. Each of the three rows of cakes is supported on and carried by two alloy chains driven by a motor and reducer.

The setup permits the operator at the discharge end to withdraw a cake for rolling as required without disturbing the two other parallel cakes in the trio.

groups and industrial research laboratories, but much needs to be done," he reports.

A third problem for engineers, Mr. McCuen claims, is to make themselves more efficient. He points out that digital and analogue computers can do months of painstaking calculations in hours. Following this example he suggests there may be other developments that can make engineering talent stretch further and accomplish more.

Net effect, he adds, could be a self-solution to the present shortage of engineers.

Tungsten Work Brings Award

First recipient of the K. C. Li award for pioneer work in tungsten was Dr. William D. Coolidge, former vice president and research director of General Electric Co. Presentation was made at Columbia university, which administers the award.

According to the citation, Mr. Coolidge conceived and developed a method for obtaining ductile metallic tungsten. His original work resulted in a product that could be drawn into a wire less than a sixth the diameter of a human hair. A later search for applications led to use in electrical ignition contacts.

Dr. Coolidge also investigated

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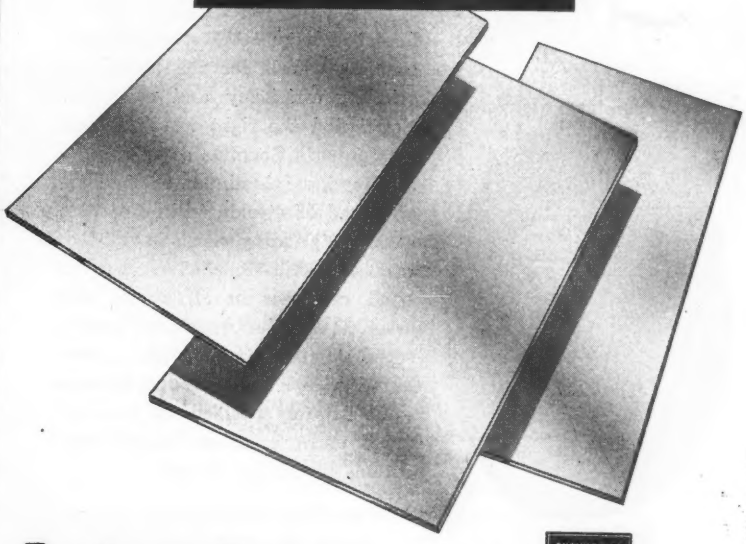
STEELS



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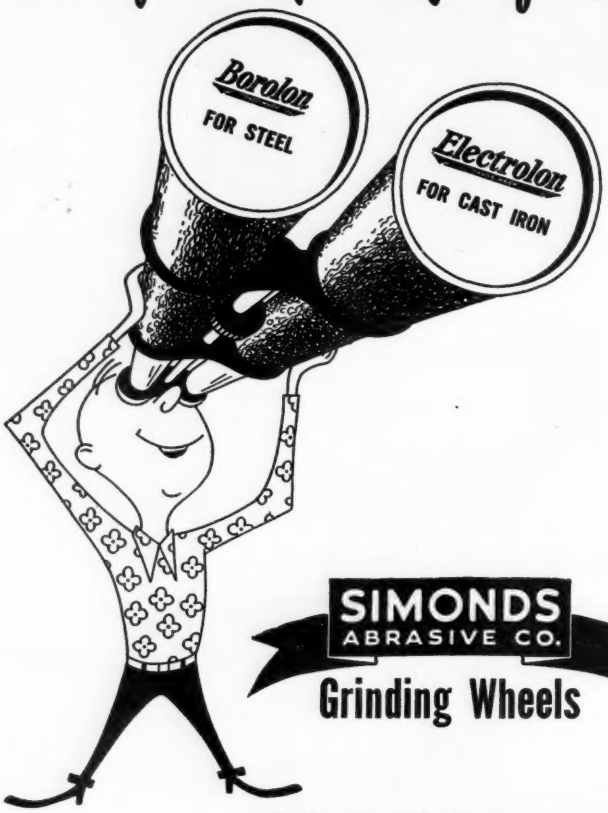

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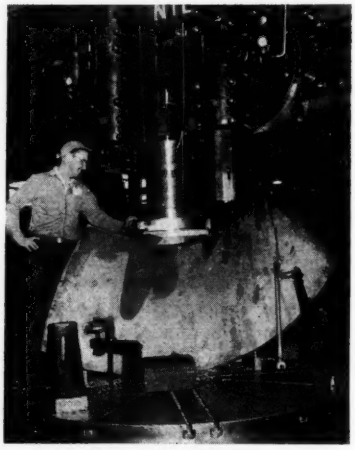
applying ductile tungsten to the target in an x-ray tube. He devised a technique for vacuum-casting in good thermal contact with a disk of tungsten so heat would be conducted away.

The award was established by K. C. Li, chairman of Wah Chang Corp., New York. Mr. Li is credited with discovering tungsten in China and is co-author of a book on the subject. Dr. Coolidge joined GE in 1905, became director of research in 1932. He has remained as x-ray consultant since his retirement in 1944.

Brazing Alloy Gains Fluidity

New copper-phosphorous-silver alloy called Phos-Silver, made for brazing copper, brass and bronze, is reported by Westinghouse Electric Corp., Pittsburgh. The company states extreme fluidity and good wetting properties enable the alloy to penetrate tight fitting joints instantly to form strong ductile bonds.

Product can be used with any of the common brazing methods for brazing on copper or copper alloys. Some of its most efficient applications are indicated where brazing temperatures are critical. On heavy sections that absorb

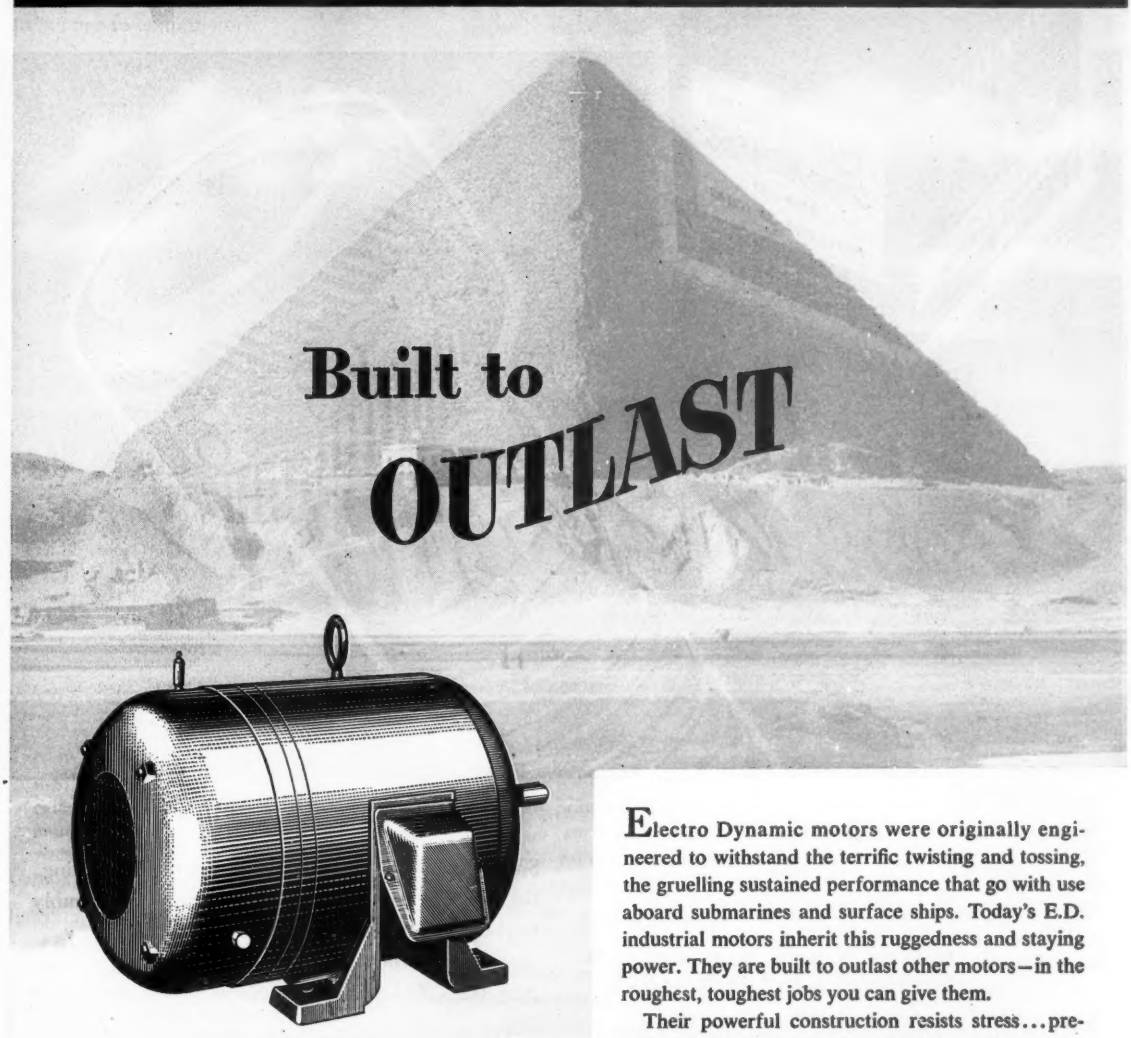


Project For Punjab

Stainless steel blades for four Kaplan adjustable-blade turbines are machined undersize to fit sleeves of a different metal. Sleeves will then serve as journals in the hub bearings. Turbines are destined for two plants of the Nangal hydroelectric project in E. Punjab, India, around the Bhakra Dam

ELECTRO DYNAMIC

INDUSTRIAL MOTORS



Industry has learned
what marine engineers
have known since 1880

**ELECTRO DYNAMIC
builds great motors**

Electro Dynamic motors were originally engineered to withstand the terrific twisting and tossing, the gruelling sustained performance that go with use aboard submarines and surface ships. Today's E.D. industrial motors inherit this ruggedness and staying power. They are built to outlast other motors—in the roughest, toughest jobs you can give them.

Their powerful construction resists stress...prevents twisting and distortion. Husky cast frames assure rigidity and combat corrosion. Special care and superior insulating materials go into the WINDINGS ..."the heart of the motor"...to assure many added years of dependable, low-cost operation.

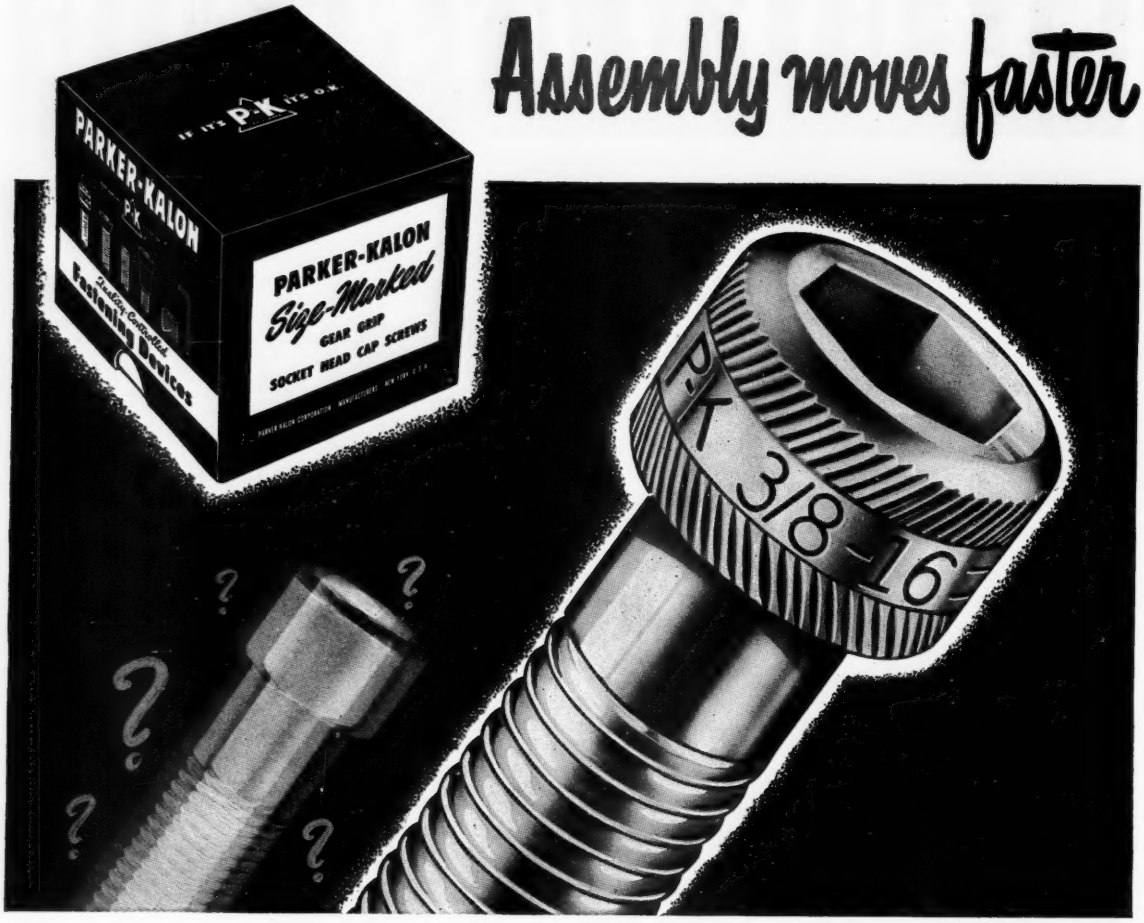
Can you profit from this *extra* strength and durability in E.D. motors? All standard enclosures...1 to 250 h.p. Write for literature today.

E.D. also makes a complete line of Direct Current Motors and Generators. Literature on request.

ELECTRO DYNAMIC • Division of General Dynamics Corporation • Bayonne, New Jersey

When all eyes can read the size

Assembly moves faster



good judgment calls for PARKER-KALON® when good design calls for SOCKET SCREWS

Your INDUSTRIAL SUPPLY DISTRIBUTOR— *your local source for P-K Socket Screws— works side by side with the P-K Assembly Engineer. Their combined efforts are solving many difficult problems of planning and procurement. Let them help you.*

Some sharp-eyed mechanics are expert at estimating the size of a plain head cap screw. But *most* assembly workers, and especially learners, need the screw that puts size beyond question . . . *the P-K Size-Mark Socket Head Cap Screw.*

The size is clearly incised on the head, can be seen at a glance. Saves time and wasted screws when sizes get mixed up, prevents errors and spoiled work. It's a good sales feature, too, because installation and repair work on your product is simpler and easier.

Only P-K offers both Size-Mark and Gear Grip in Socket Head Cap Screws. Ask for samples. See how they save time and trouble all along the line. Parker-Kalon Corporation, 200 Varick Street, New York 14.

SIZE-MARKED CAP SCREWS • GROUND THREAD SET SCREWS • FLAT HEAD CAP SCREWS • STRIPPER BOLTS • PIPE PLUGS • HEX KEYS

large quantities of heat, its low brazing temperature (1225-1275°F) is designed to reduce time of operation. In fine jobs or low melting brass, where overheating danger is serious, the product is calculated to establish an extra safety margin. It needs no flux in copper-to-copper work.

Sewage Research Projected

Research on sewage-treatment foaming problems is a joint project planned by Gilbert Associates Inc., Reading, Pa., and Commercial Solvents Corp., New York. The work entails a study of treatment in a plant having persistent foaming due to synthetic detergents, during aeration of activated sludge. Gilbert handles the engineering phase; Commercial Solvents supplies the chemicals.

Clamshell Teeth Replaceable

Reversible and replaceable teeth for clamshell buckets should cut to a fraction the time required for installation. Manufacturer, Blaw-Knox Co., Pittsburgh, says the units serve not only to reduce shutdown time but to effect further savings by restricting replacement

Nylon for Bearing Cages

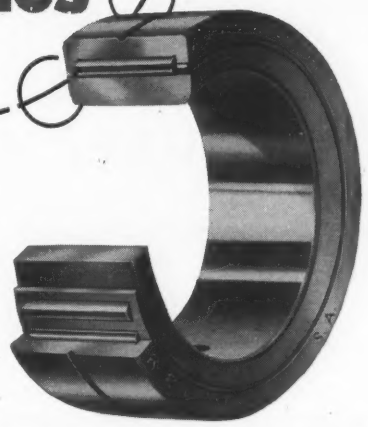
PRELIMINARY applications of molded and stamped Nylon parts show the material has excellent possibilities as a supplemental material for ball bearing races, particularly where quietness of operation and high resistance to corrosion are important.

Reports indicate, however, that much development work still is required before design limits for such bearings can be established, and also before possibilities of molded Nylon ball cages can be fully explored. Nylon shows considerable promise for the latter use, but there are some applications in which it does not give complete satisfaction.

For ball bearing seals there is not much doubt that Nylon will implement rubber in many cases. Data to date indicate that it is superior to commonly used sealing materials, and its adoption will result in improved operation.

RBC's New Concept! New Product!

PITCHLIGN
TRADE MARK
ROLLER BEARINGS



An entirely new principle of bearing construction! RBC's PITCHLIGN cage keeps the rollers in perfect alignment by contact at the roller *pitch circle*. Rollers cannot cock or skew!

Internal stresses are reduced to an absolute minimum in PITCHLIGN bearings because the cage acts *only* in the direction of rotation at a point coincident with the roller orbit. Again, accumulated tolerances or wear of load carrying surfaces have no effect on the overall efficiency of the cage, since it is supported by the two integral flanges of the heavy outer race.

PITCHLIGN is not merely an improvement on a standard type bearing—it represents an entirely *new concept*, developed in an entirely new product . . . dimensionally interchangeable with precision needle bearings.

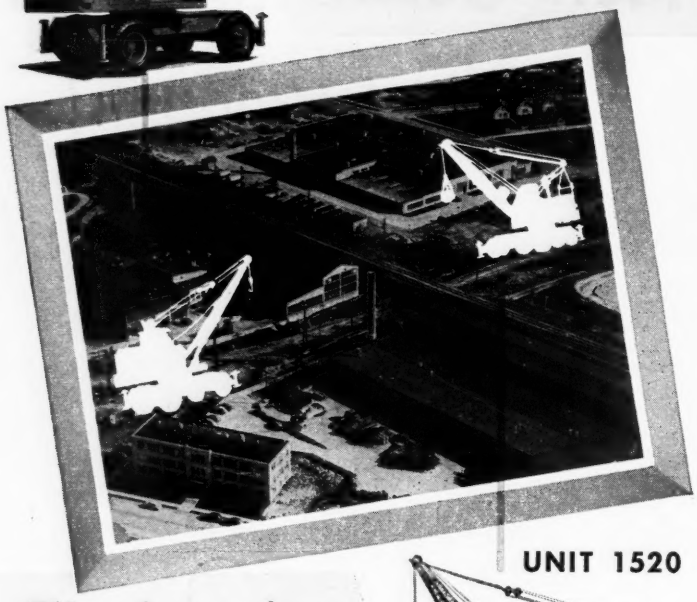
PITCHLIGN's performance potential can save you time and money. Get The Facts!

Write Today *Ask for Bulletin SF-566*

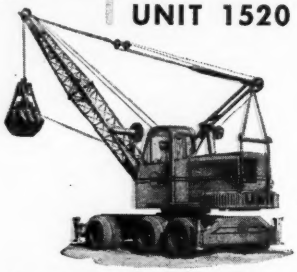
ROLLER BEARING COMPANY OF AMERICA • TRENTON, N. J.

UNIT 357

UNIT
Self-Propelled
Mobile Crane



UNIT 1520



Fits into Any
INDUSTRIAL
PICTURE!

You'll find a UNIT Mobile Crane is just the machine you need for the many material handling jobs around your plant. It's self-propelled, rides on rubber, travels anywhere. It has 1001 uses, in and out of yard. Works efficiently even in small yards where space is limited. Controlled and operated by ONE man. Powered by ONE engine. Balanced weight distribution in upper structure adds full-length stability to undercarriage. Provides full-circle, fast-cycle operation. Easy hydraulic steering. Streamlined, FULL-VISION Cab gives operator complete visibility in ALL directions. Promotes safety. Investigate these Mobile Units!

UNIT 357 — Versatile, compact, lightweight Mobile Crane, ideal for your yard lifting and loading jobs. The smoothest operating and easiest handling crane on the market. Mounted on 6 pneumatic tires, duals on rear. Capacity 10 tons. Ask for Catalog L-301.

UNIT 1520 — Heavy-duty, self-propelled Mobile Crane — another UNIT advancement in modern, high-speed, rubber-tired equipment. Lifting capacity up to 20 tons. Mounted on 12 pneumatic tires, with duals on steering axle and tandem rear axles. Ample power for the toughest jobs. Ask for Catalog 502.

UNIT CRANE & SHOVEL CORP., 6521 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

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A 5997-2/3C

Working The Angles

Special drilling head angle design is calculated to make close quarter operations easier. Head can be swiveled in any position relative to the throttle by loosening a single nut. Built-in regulator permits variable speed ranges. Mall Tool Co., Chicago, says this is its lightest ½-inch angle drill

to the part that wears out.

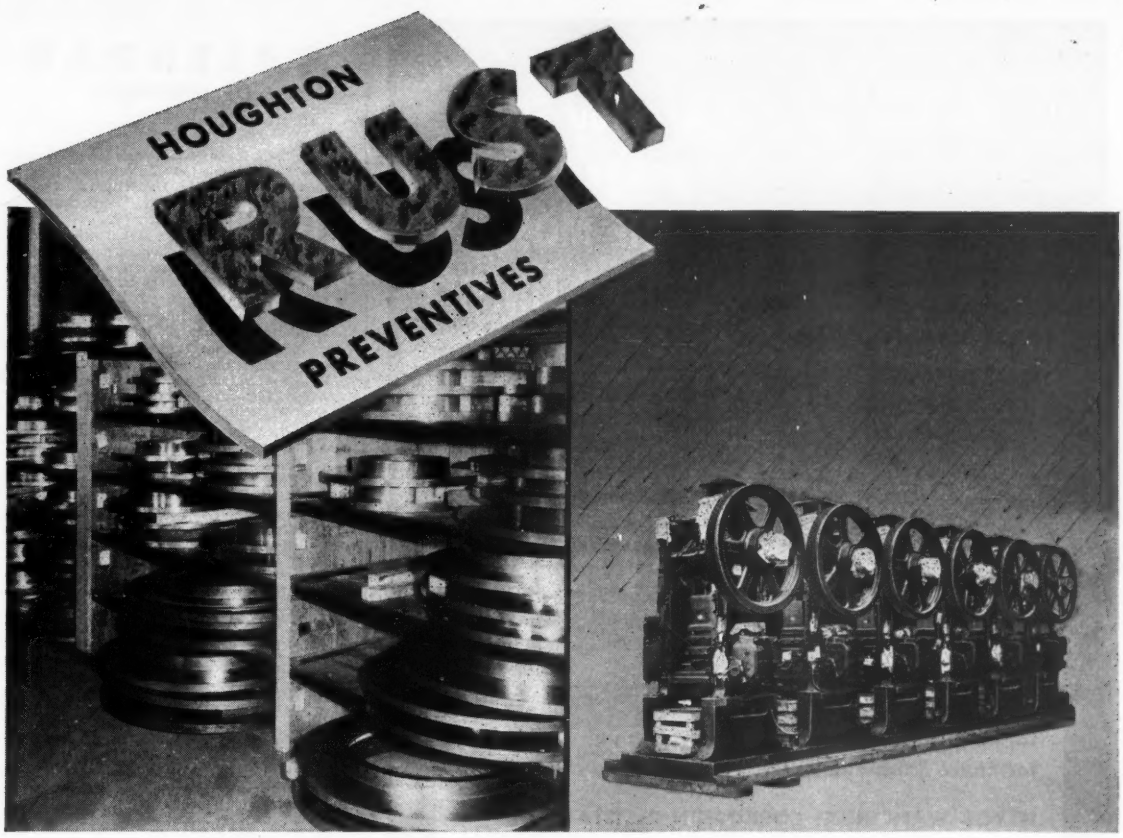
Teeth are similar in design to the two-part assemblies used previously by the company in draglines and trenchers. They consist of a base permanently attached to the scoop and a tip that fits into a slot in the base.

Fasteners Manual Revised

Revised and enlarged summary of bolt, nut and rivet standards, containing all current standards for commercial fasteners, has been published by Industrial Fasteners Institute. Book replaces the first edition, issued in 1941.

New standards reported include those for round head, plow and track bolts; studs; slotted, recessed and socket head screws; small solid rivets and large rivets; unified screw threads and the square and hexagon bolts and nuts unified dimensionally with Great Britain and Canada. One large section lists weights and stock production sizes. Discussions follow on screw threads, gaging practices, fastener materials and manufacturing practices. A complete list of all recognized fastener specifications concludes the work.

Copies are available for $3 from the institute, Cleveland 14.



THEY KEEP CORROSION AWAY BY BEING "TOUGH" INDOORS OR OUT!

for general industrial use specify

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Rust Veto 344—Solvent, Polar Type
Rust Veto 110-D—Varnish Type
Rust Veto A-2—Dry Film, Waxy Type
Rust Veto 377—Solvent, Oil Type
Rust Veto 266—Fingerprint Neutralizer
Rust Veto Light, Medium, Medium Heavy, Heavy, and Extra Heavy—Inhibited Oil Types
Rust Veto Concentrate—for dilution by user

to meet Government Specifications use

"COSMOLINE"

Cosmoline 2-82C (Type P-4)
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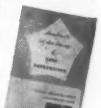
Cosmoline 333 (Type P-12 AN-C-124A)
Cosmoline 377 (Type P-3 AXS-1759 Gr. 2)
Cosmoline 332 (Type P-7 USA-2-122)
Cosmoline 335 (MIL-L-3150)
Cosmoline 946 and 947 (Type P-10 USA 2-126)
Cosmoline 911 (MIL-C-6708-Type 1)
Cosmoline 344 (Type P-1 AXS-673)
Cosmoline 1120-1123 (AN-VV-C-576B)
Cosmoline 910 (JAN-P-115 Wax)
Cosmoline 1044 (Type P-9 MIL-L-644a)

Houghton—closely identified with rust prevention since 1869—supplies industry with a complete line of solvent types, dry or waxy film, oils and grease varieties.

The big difference between ordinary rust preventive oils and greases and the Houghton products is *surety of protection.* Their "polarized" adherence to metal gives your parts and products the safe, long-term protection you want, indoors or out—on shelves or in shipment—idle or in use. Yet they can be removed readily when required.

Our latest Rust Preventives Bulletin includes a chart describing these products—some of which are listed on this page. It outlines their varying types of protection and wide range of uses throughout industry.



Ask the Houghton Man for a copy or write to E. F. Houghton & Co., Philadelphia 33, Pa.

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Ready to give you on-the-job service . . .

Are you SURE you're using THE MOST EFFICIENT FINISH?

If your production involves finishing zinc, cadmium, aluminum or cuprous metals, you owe it to yourself... and your customers... to investigate

IRIDITE®

for on any of these metals Iridite gives you a high performance finish at a low cost from a simple chemical dip.

IF YOU WANT HIGH CORROSION RESISTANCE, you'll find an Iridite that will meet any military or civilian specifications for chromate finishing.

IF PAINT ADHERENCE IS IMPORTANT, you'll find Iridite prevents underfilm corrosion and soap formation.

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investigate zinc plate and Iridite (Bright) for a chrome-like decorative finish with more corrosion protection than conventional chrome plating . . . or Iridite (Metcote) as a treatment for copper that eliminates the need for buffing in the copper-chrome system; produces a sparkling bright finish!

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CALENDAR
OF MEETINGS

June 2-3, Multiple V-Belt Drive & Mechanical Power Transmission Association: Spring meeting, Edgewater Beach Hotel, Chicago. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 2-4, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

June 2-13, Canadian International Trade Fair, Exhibition Grounds, Toronto.

June 3-6, National District Heating Association: Annual meeting, Skytop Lodge, Skytop, Pa. Association address: 827 N. Euclid Ave., Pittsburgh 6. Secretary-treasurer: John F. Collins.

June 5-7, Electric Metal Makers Guild Inc.: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Guild address: Box 6026, Mt. Washington Station, Pittsburgh. Secretary: C. B. Williams.

June 9-21, International Organization for Standardization: Triennial meeting, Columbia University, New York. Secretary-general: Henri St. Leger, Geneva, Switzerland. Host association: American Standards Association, 70 E. 45th St., New York 17. Secretary: George F. Hussey Jr.

June 13, The Wire Association: Regional meeting, Hotel Biltmore, Los Angeles. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

June 15-18, National Association of Cost Accountants: Annual international cost conference, Waldorf-Astoria Hotel, New York. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

June 15-19, American Society of Mechanical Engineers: Semi-annual meeting, Sheraton-Gibson Hotel, Cincinnati. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

June 16-17, Malleable Founders Society: Annual meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

June 16-20, American Electroplaters Society: Annual meeting and industrial finishing exposition, Hotel Conrad Hilton and International Amphitheatre, Chicago. Society address: Box 168, Jenkintown, Pa. Secretary: D. Gardner Foulke.

June 16-20, American Crystallographic Association: Summer meeting, Camp Tamiment, Pa.

June 17-19, American Management Association: General conference, Waldorf-Astoria Hotel, New York. Association address: 330 W. 42nd St., New York.

June 22-24, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Secretary: E. A. Schoefer.

June 23-26, Radio-Television Manufacturers Association: Annual convention, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 23-27, American Institute of Electrical Engineers: Summer general meeting, Hotel Nicollet, Minneapolis. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

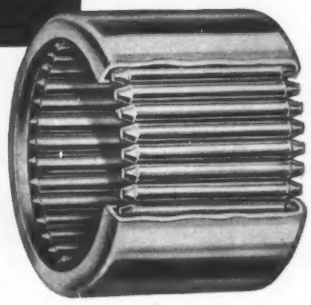
June 23-27, American Society for Testing Materials: 50th anniversary meeting and exhibit, Hotel Statler and New Yorker, New York. Society address: 1916 Race St., Philadelphia. Secretary: C. L. Warwick.

June 23-27, American Society of Mechanical Engineers: Oil & Gas Power Division conference, Hotel Statler, Buffalo, N. Y.

June 29-July 2, National Industrial Advertisers Association: Annual meeting, Palmer House, Chicago. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 29-July 2, Caster & Floor Truck Manufacturers Association: Joint material handling, industrial meeting, Grand Hotel, Mackinac Island, Mich. Association address: 7 W. Madison St., Chicago 2.

david tames goliath...



Torrington Needle Bearings are small—but mighty! A full complement of precision-ground rollers distributes loads evenly over an extra-large area . . . providing greater radial capacity in relation to O. D. than any other type of anti-friction bearing.

This high capacity, combined with compact size, has helped improve the efficiency of many products. So have other Needle Bearing advantages—light weight, easy lubrication and long service life. Ask our engineers to give you the whole story on Torrington Needle Bearings in terms of *your* product!

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TORRINGTON *NEEDLE* BEARINGS

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
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The World's Largest Job Galvanizing Plant
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HOT DIP GALVANIZING

galvanizing . . . . pickling . . . . painting . . . . oiling

New Products and Equipment

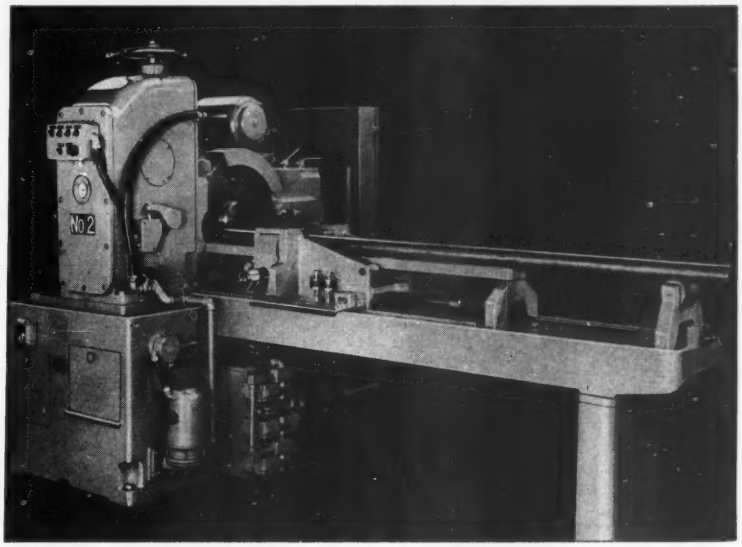
Stock Feeder Attachment

USE REPLY CARD—CIRCLE No. 1

Standard No. 2 circular sawing machine made by Motch & Merryweather Machinery Co., 715 Penton Bldg., Cleveland 13, O., can be equipped with a stock feeder designed to feed bar stock for shell forgings. This automatic feeder consists of two heavy-duty, hardened, serrated feeder grippers mounted on a slide. Bar stock is positioned on the supporting v-channel under the vertical vise for initial cropping squaring cut. Vise is actuated hydraulically.

Grippers clamp the stock and entire slide, operating between positive stops, moves stock forward the required length. When stock is clamped in the vise, grippers release, slide moves to rear stop and grippers reclamp.

Wear parts are hardened and ground; sliding surfaces lubricated automatically. Operator can increase percentage of efficiency by positioning the succeeding bar on the supports before stock is exhausted. Machine takes 1 to 6½-inch round stock; has ¼ to 36-inch feed length.



AUTOMATIC FEED FOR CIRCULAR SAWING MACHINE
. . . designed especially to feed bar stock for shell forgings

Inclinable Power Press

USE REPLY CARD—CIRCLE No. 2

Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4 Minn., offers an open back inclinable power press with 60-ton capacity. Press has heavy-duty one piece special alloy frame with built-in tie rods. The latter provide extra reinforcements to the press gap, eliminating deflection and binding or poor alignment on heavy work. Model 60 has the company's Airflex clutch and brake system. Clutch is constricting brake type, completely self-compensating for wear. Brake and clutch cannot be engaged simultaneously. Clutch gripping pressure can be set for every operation and required tons, thus avoiding damage to jammed dies or to the press.

Model has extra heavy ram slide with large and long ram ways, triple lubricated with bushed hole for holding die shank. Back-geared or flywheel types are available. Bolster area is 21 x 32 inches; throat depth, 11 inches. Shut heights and strokes are optional.

Desk-Type Metallograph

USE REPLY CARD—CIRCLE No. 3

Microscopic study of metals under polarized light as well as phase and bright field illumination is possible with a desk-type metallograph announced by Instrument Division, American Optical Co., Buffalo 15, N. Y. All operations are performed at the single desk with every control in easy reach. Final focusing for photographs is done automatically and accurately while examining the specimen through the parfocal visual system. Quadruple revolving nosepiece permits rapid change of objectives. Automatic, motor-driven arc lamp is adjusted easily and accurately and a separate, built-in illuminator is used for visual inspection.

Coated reflector is used in the vertical illuminator, yielding plane polarized light, free from disturbing elliptical polarization. A slot receives compensators and phase annular diaphragms. Full and quarter-wave compensators are standard, making possible color differences to accentuate slight differences in contrast.

REPLY CARDS

on page 163 will bring you more information on any new products and equipment in this section.

Unit Extends Graphic Range

USE REPLY CARD—CIRCLE No. 4

Brush Development Co., 3405 Perkins Ave., Cleveland 14, O., announces its High Gain model BL-954 preamplifier, designed to permit extension of the measurable range of graphic recording instruments or cathode ray oscilloscopes into the microvolt region. It is said to maintain a relatively flat frequency response from 0.2 to 400 cycles per second.

Instrument is made for use with the company's magnetic direct writing oscillographs and medium or low gain amplifiers. Voltage gain is 200,000 times when operated push-pull. When used with the company's oscillographs and amplifiers it is sufficient to give one millimeter of pen deflection

Every help you carbide

Which can you use?

It's not difficult to design and apply cemented carbides to an ever-expanding range of applications in your plant. And by doing so, you'll get the tremendous plant-wide benefits that only super-hard carbides can give you.

But to make the job easier, faster, and to make sure that you get the *fullest* benefits possible, here are practical carbide helps *free* for the asking.

They are part of the Carboloy Service Program—a *comprehensive* program of personal and printed carbide aids that covers, individually or in combination, *every* question concerning the use of cemented carbides.

They'll help you increase production, lower downtime and maintenance, get longer tool life, better product finishes and fewer rejects . . . in short, increased tool efficiency.

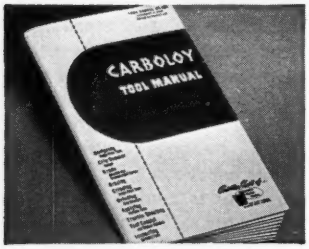
Fill out the coupon for quick action on the services you'd like right now. (Why not save this advertisement, too, for future reference?)

1 ***FIELD ENGINEER:*** Just the carbide expert to help solve a production bottleneck or tough machining problem—the Carboloy Field Engineer. He's wise in ways of getting peak tool and die performance through carbides, knows all the latest carbide techniques. He'll give you a hand in design and application of carbides to new jobs, or help you get greater benefits from carbides you now use. His services are FREE.

CARBOLOY

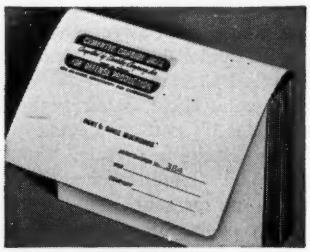
DEPARTMENT OF GENERAL ELECTRIC COMPANY

World's oldest and largest producers of cemented carbides



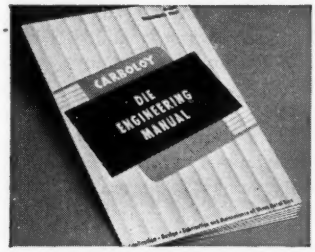
2 ***TOOL MANUAL:*** A comprehensive, 200-page handbook that gives you basic data on the design, use and maintenance of carbides. Over 800 illustrations. Easy step-by-step details. 50c per copy (FREE to industrial supervisors).

3 ***CCC PLAN BOOK:*** Tells how you can get outstanding carbide benefits, *plant-wide*, through organized program of Coordinated Carbide Control. The "Triple C" Plan is tested, proved by hundreds of companies. Get Plan Book FREE!

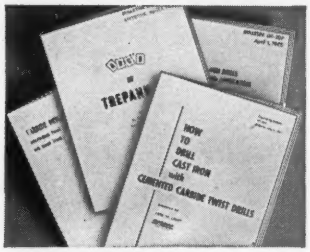


4 ***SHELL MACHINING:*** Highly practical, technical data for defense production for your in-plant use. This new, invaluable kit is for shell contractors only . . . typical of the great range of Carboloy literature available. Get yours FREE!

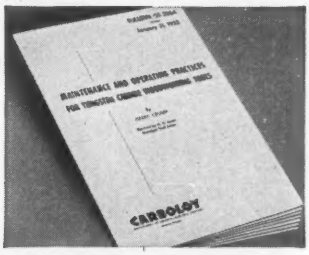
need for increased tool efficiency... FREE!



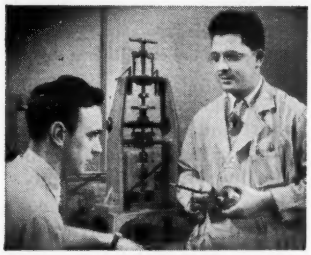
5 ***DIE ENGINEERING MANUAL:*** A well-illustrated, well-rounded manual that contains countless tips on application, design, fabrication and maintenance of carbide sheet-metal dies. Another in-plant Carboloy Service help. Yours FREE!



6 ***DRILLING DATA:*** Invaluable technical data on all types of drilling with carbides. Includes drilling cast iron with carbide twist drills, deep-hole trepanning, carbides in gun drilling, etc. You'll want this how-to-do-it data. FREE!

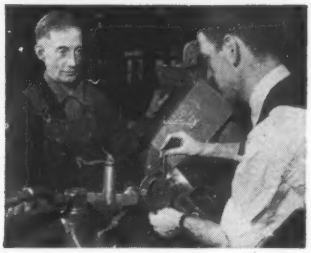


7 ***WOODWORKING DATA:*** Helpful material on use of carbides in woodworking. Shows how saws, router bits, joiner heads, cutters and other carbide-tipped tools modernize woodworking as they did metal cutting. Send coupon. FREE.

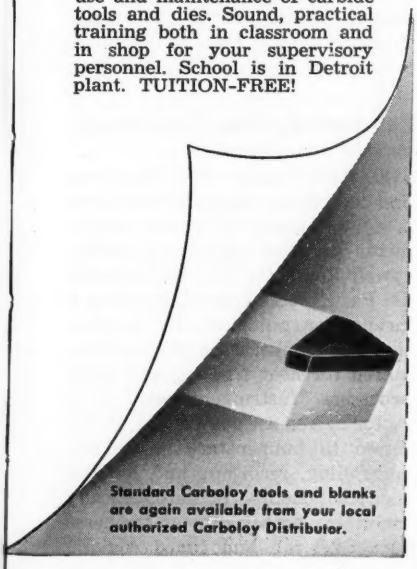


8 ***TRAINING SCHOOL:*** Excellent courses in all phases of design, application, use and maintenance of carbide tools and dies. Sound, practical training both in classroom and in shop for your supervisory personnel. School is in Detroit plant. TUITION-FREE!

9 ***STAFF OF ENGINEERS:*** For the more complex problems pertaining to the use of carbide tools and dies, there is a large staff of Carboloy engineers at the Carboloy Detroit plant. Send your specifications. Your problem is theirs. A FREE SERVICE!



10 ***LOCAL SERVICES:*** Your local authorized Carboloy Distributor also is a carbide expert. He maintains a well-experienced staff who can get out to your plant *fast*. Call him whenever you need carbides, or carbide helps. No obligation. FREE SERVICE!



Standard Carboloy tools and blanks are again available from your local authorized Carboloy Distributor.

——CLIP AND MAIL TODAY...FOR FREE CARBOLOY SERVICES——

CARBOLOY Department of General Electric Company
11141 E. 8 Mile Ave., Detroit 32, Michigan

I am interested in your carbide services. Please send, without cost or obligation, the material, details or a Carboloy representative, as checked below.

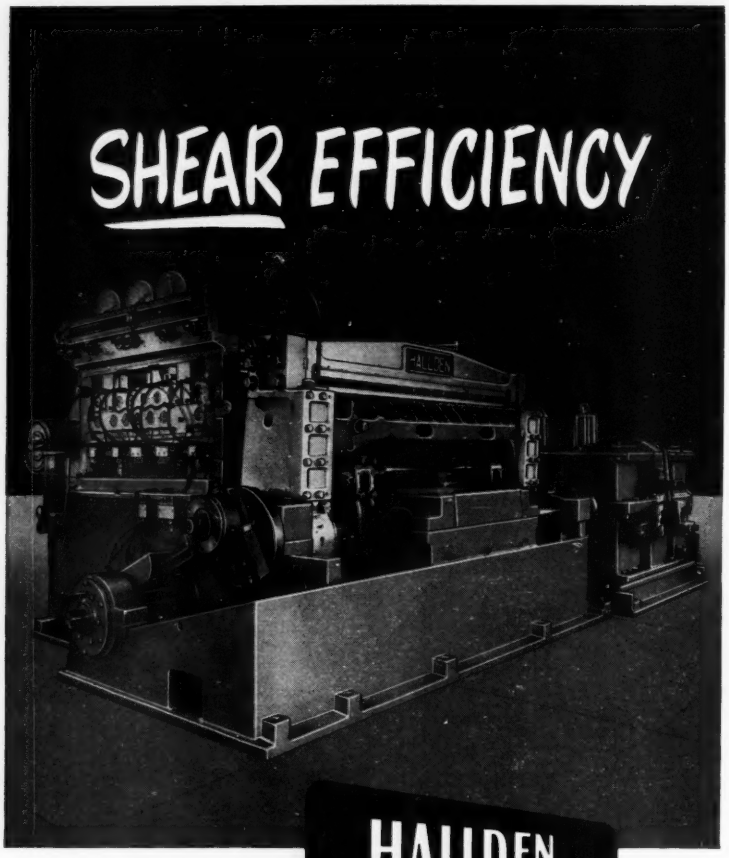
☐ Field-Engineer Call ☐ Tool Manual ☐ Drilling Data ☐ CCC Plan Book
☐ Shell Machining Data (only if you are a shell contractor) ☐ Training School Details
☐ A Distributor-Representative Call ☐ Die Manual ☐ Woodworking Data

Name_____ Position_____

Company_____

Address_____

City_____ Zone_____ State_____



Hallden Machines are designed to give modern steel mills maximum efficiency in flattening and cutting off operations. They permit continuous feed of metal through the machine at accelerated speeds while maintaining precision cutting accuracy. Low center of gravity, rugged construction and compactness assure uninterrupted operation. Remember, too, that Hallden Shears are completely automatic.

Take *your* shearing problems to Hallden, the *shearing specialists.*

THE HALLDEN MACHINE COMPANY

THOMASTON, CONNECTICUT

Sales Representatives

The Wean Engineering Co., Inc., Warren, O. T. E. Dodds, Pittsburgh, Pa.

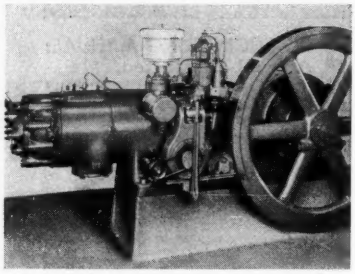
W. H. A. Robertson & Co., Ltd., Bedford, England

for 2.5 microvolts input. Noise and hum interference have been reduced by use of a battery power supply. Control panel includes a meter to indicate battery voltage, calibration, pushbutton and gain control.

Single-Cylinder Diesel Engine

USE REPLY CARD—CIRCLE No. 5

Horizontal single-cylinder two-cycle diesel engine is added to the line of Lorain power plants made by White-Roth Machine Corp., Lorain, O. Called model DA, the engine has a 13-inch bore and stroke, and continuous rating of 55 brake-horsepower at 325 rpm. It has



. . . continuous rating of 55-bhp at 325 hp

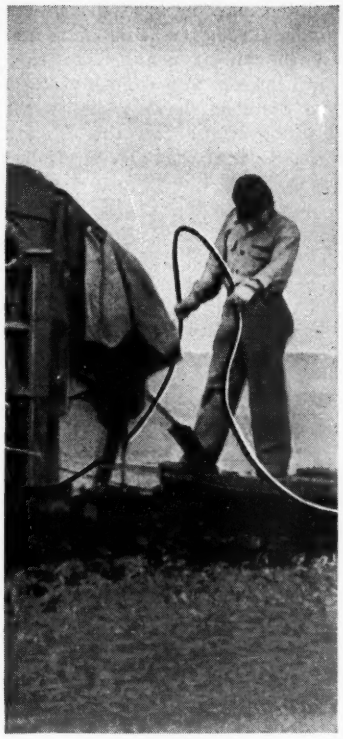
tapered roller bearings in the crankshaft and auxiliary shafts. A wet sleeve cylinder liner of alloy cast iron helps assure long life.

Engine can be operated as a cold-starting full diesel, or converted to burn natural gas or butane. Radiator-type cooling system is adequate under all load or atmospheric conditions. Built-in 7½-hp gasoline starter is standard equipment. Company's Twin Disc clutch is optional.

Unit Controls Time, Temperature

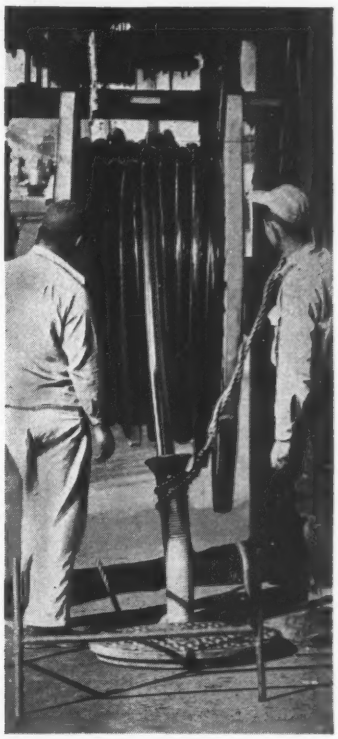
USE REPLY CARD—CIRCLE No. 6

Electronic strip chart recording and indicating program controller is a development of Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa. Process control provides a means for automatically conducting time-temperature programs required for heat treating and other processes. Instrument employs a motor-driven set point index, in addition to temperature measuring, controlling, recording and indicating components. It automatically maintains preset rate of temperature rise, fall and timed soaking



DIRECT BURIAL

OVERHEAD



IN DUCTS

Low-cost way to hit the **high** and **low** spots—

use All-Purpose DURASHEATH

DURABLE DURASHEATH* can be used for every type of power and lighting application up to 15kv**. The most important fact about this all-purpose cable is that it may be run *overhead, buried directly underground* and run *in ducts* in one continuous length. Expensive splicing is avoided. Durasheath eliminates sheath electrolysis. It effectively resists condensation, weathering, sunlight, organic decay, abrasion and mechanical injury.

You can look for *three* definite savings with Durasheath. It costs less to install. It is flexible and light. It lasts longer. Its special neoprene jacket is tough enough to stand up to every natural enemy of cable life. It simplifies stock inventory. You need purchase only *one* cable—versatile Durasheath—to meet every electrical distribution requirement.

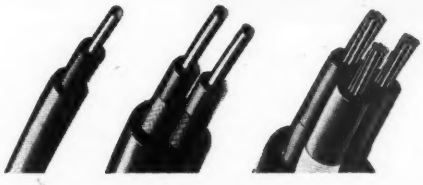
Ask your nearest Anaconda Sales Office or Distributor for the whole story on Durasheath. Then convince yourself how much you will save by using Durasheath. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Trademark

the right cable for the job ANACONDA® wire and cable

available in all sizes—from large to small—single and multi-conductor.

for traffic control, airport† power and lighting, mines, industrial plants, railroads, street lighting, and many other uses.



†when ordered to CAA Specifications L-824.
**for voltages over 5kv consultation with Anaconda Engineers is recommended.

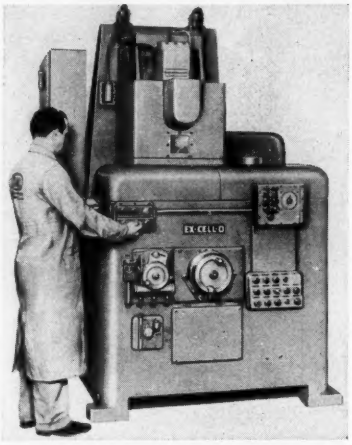
or holding periods, Controller is available as a single or multi-record electric contact or proportional controller, or as a single-record pneumatic controller.

Blade Finishing Line Expanded

USE REPLY CARD—CIRCLE No. 7

Precision surface form grinder, style 84, is an addition to the line of standard blade finishing machines made by Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. The model grinds flat, grooved or curved surfaces on the roots of jet engine compressor blades and turbine buckets. Machining cycle is fully automatic. Machine has a heavy, rigid base; hydraulically operated and electrically controlled reciprocating work table. It accommodates removable work fixtures designed to suit individual blades or buckets.

Grinding spindle is mounted horizontally and is adjustable for positioning preformed wheels with relation to the dresser. Motor mounted on the base drives the spindle through v-belts. Belts and pulleys can be changed to vary wheel speeds. The company's cam type diamond dresser shapes the grinding wheel for the desired form. Dresser can be controlled manually for setting up a new wheel or adjusting the cam. A central handwheel, arranged with coarse and fine feed, controls grinding size. Automatic feed to finish size and retract are part of the machine cycle.



. . . grinds flat, grooved or curved surfaces

30-Ton Hydraulic Ram

USE REPLY CARD—CIRCLE No. 8

Owatonna Tool Co., 398 Cedar St., Owatonna, Minn., offers a 30-ton hydraulic ram made for difficult pulling and installing jobs. Unit weighs 23 pounds and is designed with the company's center hole construction. Working in any position, the ram is fully adjustable and eliminates torque. It is 6¾ inches high, 7½ inches wide and 3 inches thick; ram travels 2½ inches. Complete set of attachments is available for use on industrial tractors, earth moving equipment or plant maintenance.

Automatic Sand Tester

USE REPLY CARD—CIRCLE No. 9

Automatic sand testing machine, the Sand Controller, made to determine and record the permeability, green strength, green deformation and temperature of molding sand, is a development of Harry W. Dietert Co., 9330 Roselawn Ave., Detroit 4, Mich. Unit adds the

When it comes to production—come to Hartford Special

NEW Larger Size—Greater Capacity

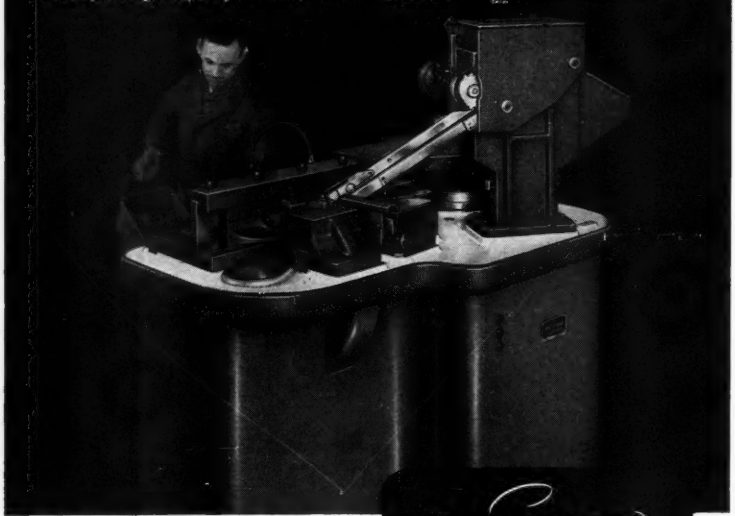
AUTOMATIC THREAD ROLLER

MODEL A-312-H

The Hartford Special Model A-190 Automatic Thread Roller has now been on the market for more than three years. During this time it has met with universal satisfaction from its many users, and this favorable reception and experience by the trade has naturally influenced us to design and develop a larger capacity machine.

NOW HARTFORD SPECIAL ANNOUNCES the new Model A-312 Thread Roller which takes machine screws up to 5/16" diameter by 2½" long at a production rate up to 140 pieces per minute dependent upon screw size.

If you roll threads, write for Bulletin TR-312-100.

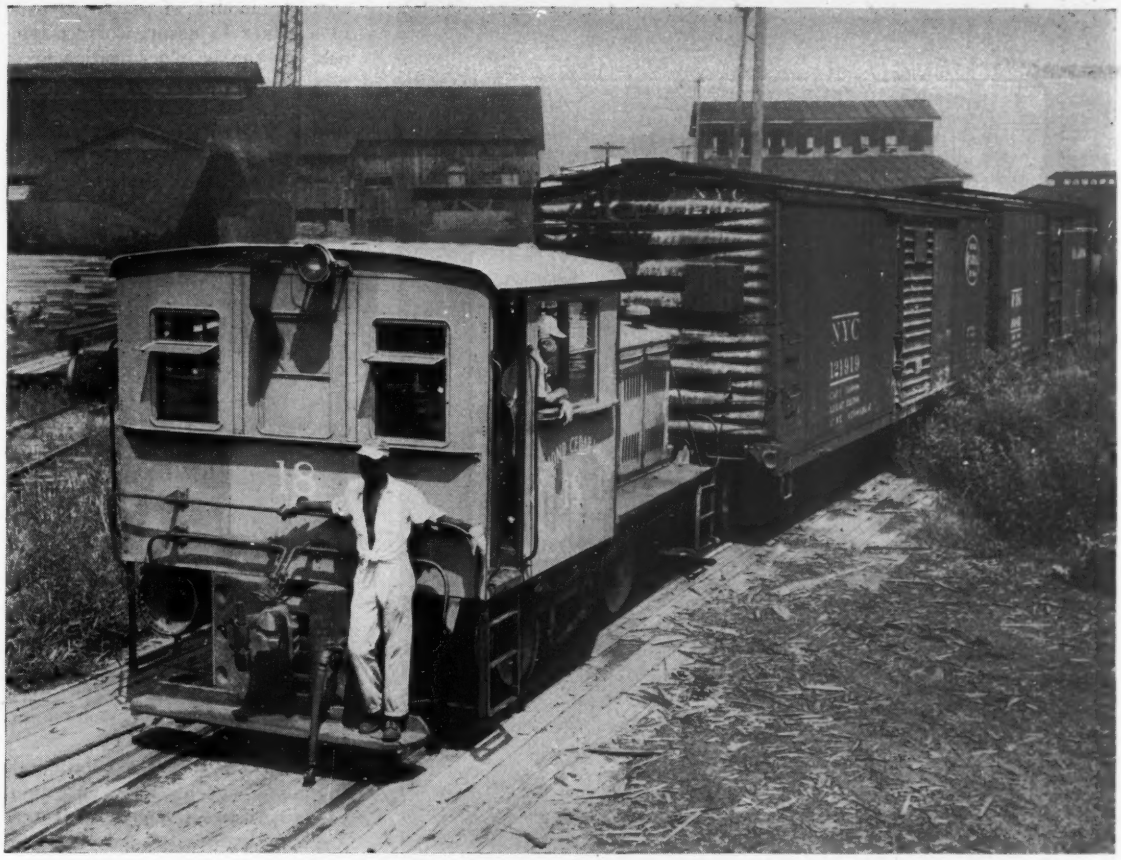


Hartford Special also makes these production machines

SUPER-SPACERS AUTOMATIC DRILLING & TAPPING MACHINES

HARTFORD Special

THE HARTFORD SPECIAL MACHINERY CO.
HARTFORD 12, CONNECTICUT



Does a big job at low cost!

Companies from Coast to Coast are saving time and money, increasing production and efficiency by using Plymouth switchers.

Wm. S. Rogers, Jr., Purchasing Agent, Richmond Cedar Works, Norfolk, Virginia, writes, "Our 30-ton Plymouth Locomotive has increased over-all operating efficiency and given us a definite saving over former methods of hauling. It is on the job 50 hours a week. Maintenance time is only 4 days a year. The Plymouth operates on 10 miles of track, shifting standard gauge cars in the yard and hauling loaded cars of lumber to the Belt Line. Fuel consumption averages 2¼ gals. per hour."

Dependable, economical Plymouth Locomotives may be the answer to your haulage problem. Their fine engineering and rugged construction have made them "Industries' Favorite Switchers." Available in standard or narrow gauge models. Plymouth Locomotives are equipped with gasoline or Diesel-mechanical, Diesel-electric, or gasoline or Diesel-hydraulic drive in models from 3 to 70 ton sizes. Write today for catalog.

PLYMOUTH LOCOMOTIVE WORKS, Division of The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.

PLYMOUTH® LOCOMOTIVES

Also manufacturers of F-R-H Ceramic Machinery

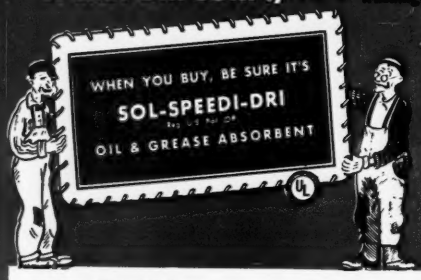
HOLD IT TILL I SHAKE HANDS WITH OLD PIE TROUSDALE-- I AIN'T SEEN HIM FOR DAYS!
WHY, PIE, WHAT ARE YOU DOIN' OVER IN THIS NECK? HOW ARE YOU?
OL' PIE IS TRAPPED-- THEM GUYS LOVE TO MAUL AN' MESS UP A FELLA WITH A CLEANER JOB!
IT AIN'T TH' JOB, IT'S TH' SHOP-- THEY USE SOL-SPEEDI-DRI!
ACROSS THE TRACKS
J.R. WILLIAMS

Old-fashioned value keeps it sales leader!

SOL·SPEEDI·DRI

Pound for pound—dollar for dollar, Sol-Speedi-Dri gives you *more for your money*, all factors considered. It's this old-fashioned value that keeps Sol-Speedi-Dri the biggest seller in the oil and grease absorbent field. You can count on *consistent* quality, too—laboratory testing sees to that. Send coupon today for free sample and literature about "dry-cleaning" your floors with Sol-Speedi-Dri.

SPEEDI-DRI CORP., 714 W Washington Sq., Philadelphia 5, Pa.



Warehouse stocks maintained in principal cities of the United States and Canada.

• • •

Inquiries in New York, New England, and New Jersey should write to Speedi-Dri Corp. Elsewhere in U.S. to Waverly Petroleum Products Co., 1724 Chestnut St., Phila. 3, Pa. In Canada, G. H. Wood & Company Ltd., Toronto. Branches throughout Canada.

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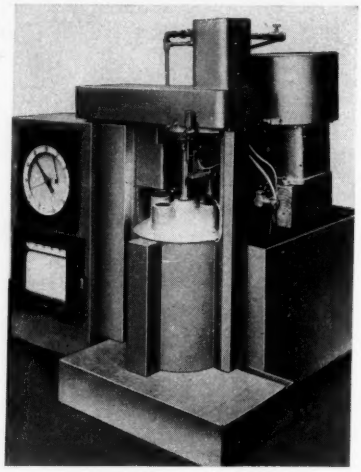
S 6-2-52

correct amount of water to sand in a mixer to assure correct temper. It can be placed adjacent to mixing equipment or sand conveyor belt in the foundry without operator attention.

Testing speed can be selected from a rate of 15 seconds per sample to one test every 6 minutes. It can be synchronized with conveyor belt or mixing equipment to start and stop with mated machinery. A continuous record of sand properties is retained for each day of operation. Controller takes 33 x 21 inches floor space and is 55 inches high.



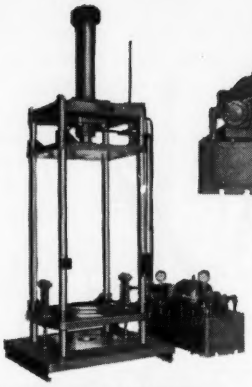
. . . determines and records characteristics

Electronic Trouble Spotter

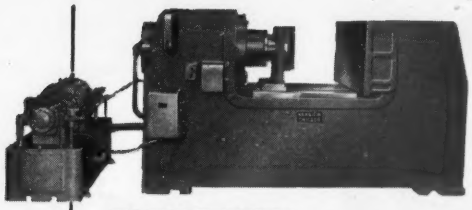
USE REPLY CARD—CIRCLE No. 10

Erwood Inc., 1770 Berteau St., Chicago 13, Ill., introduces its electronic vibration tester, developed for solving maintenance and inspection problems. Incorporating a pickup probe and three-stage amplifier, the Electro-Probe is sensitive to vibrations at point of contact but unaffected by airborne noises. Speaker and head phones provide audible comparison of vibration sounds within a range of 60 decibels; calibrated meter provides visual indication.

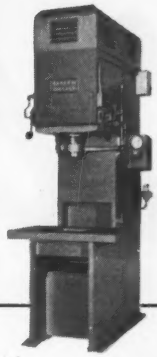
Relative indicating device should be useful for such maintenance jobs as detecting and diagnosing trouble developing in running motors or machines before failure occurs. For inspection, an acceptable part or assembly reading can be the basis for passing or reject-



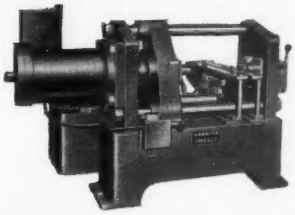
WATER HEATER TANKS are assembled with this 50-ton, 4-column press. Special hydraulic stripper plate raises tank from lower die after assembly.



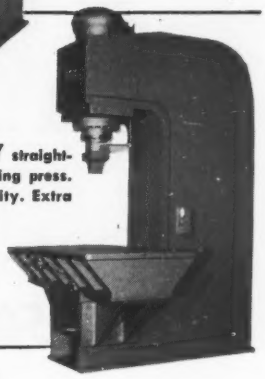
TRACTOR WELDMENTS for main frames and roller frames are straightened with this 100-ton press. Horizontal design permits use of hoist for easier handling.



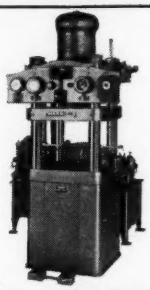
DIE CASTINGS are trimmed on this 25-ton, long stroke, open gap press. Controls reverse on distance; extremely high speed advance and return. Easy on dies. Scrap chute in table.



TRACTOR TRACK LINKS are press-fit assembled in this 50-ton, 3-column press. Assembly includes bushings and connecting pins. Press indexes for various sized links.

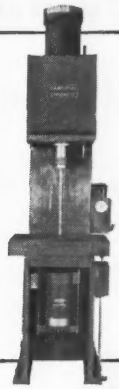


HEAVY DUTY straightening and forcing press. 150-ton capacity. Extra reach and large table permit handling heavy work.

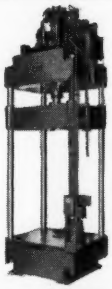


HELICAL CUTTER BLADES are formed with this 75-ton, 4-column press. 2-step, timer-controlled operation forms part. Special attachment ejects part and relubricates dies with graphite.

WHEN IT COMES TO PRESSES ...COME TO HANNIFIN



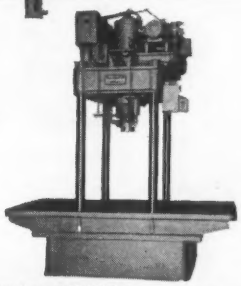
GENERAL PURPOSE 25-ton open gap press. Die cushion under table permits use for drawing operations.



FIBERGLAS PLASTICS are molded with this 50-ton, 4-column platen press. Automatic controls permit high-speed approach, slow closing on dies. Long stroke and extra "daylight" for deep parts.

When your production calls for hydraulic presses, investigate the Hannifin line that includes more than 75 standard models, capacities to 150 tons.

Quite probably you can select the press you need directly from the complete Hannifin catalog . . . or a Hannifin Field Engineer will demonstrate how easily one of these standard models can be modified to meet your requirements. Hannifin Corporation, 1117 South Kilbourn Ave., Chicago 24, Ill.



LARGE WELDMENTS are straightened on this 75-ton, 4-column press. Sensitive pressure control, extra large work table.

Hannifin Representatives Are at Your Service in These Leading Industrial Centers

Atlanta, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Houston, Los Angeles, Milwaukee, Minneapolis, Moline, New Orleans, New York, Philadelphia, Pittsburgh, St. Louis, Seattle, Richmond, Va.; Rochester, N. Y.; South Bend, Ind.; Washington, D. C.; Worcester, Mass. In Canada, F. F. Barber Machinery Co., Toronto, Montreal, Windsor, Hamilton, Vancouver.

HANNIFIN

Hydraulic Presses • Pneumatic Presses • Hydraulic Riveters
Hydraulic Cylinders • Air Cylinders • Air Control Valves

WRITE FOR BULLETIN 130

Hannifin Corporation
1123 S. Kilbourn Ave., Chicago 24, Illinois
Please send me Bulletin 130 on Hannifin Hydraulic Presses.

Name.....

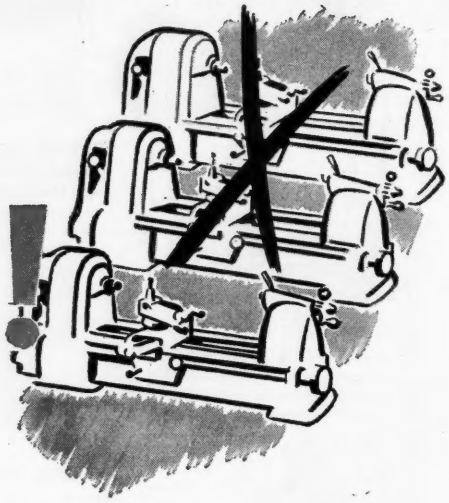
Position.....

Company.....

Address.....

City.....*State*.....

Labor SAVING!



with 854 sizes of . . . stock bearings for all applications in machine tools and industrial machinery.

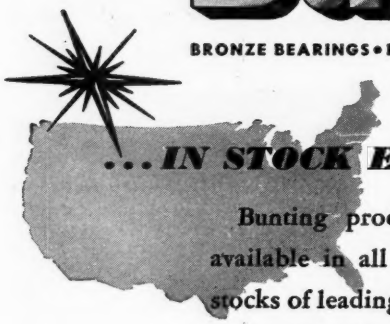
with 324 sizes of . . . replacement bearings for all popular sizes and makes of electric motors.

with 263 sizes of . . . completely machined tubular and solid bronze bars.

Hundreds of different sizes of Bunting Bronze bearings and bars make it easy to select a size that fits the job.

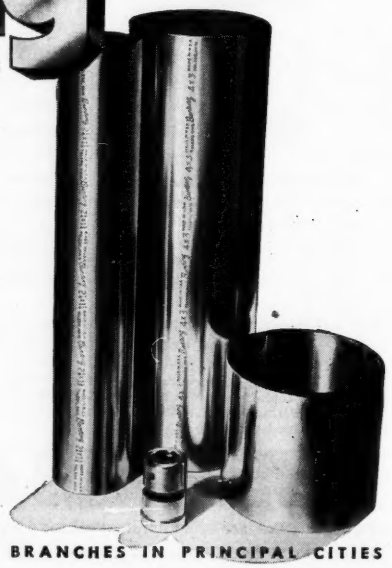
Bunting®

BRONZE BEARINGS • PRECISION BRONZE BARS • BUSHINGS



. . . IN STOCK EVERYWHERE

Bunting products are instantly available in all markets, from the stocks of leading industrial distributors and distributors of specialized industrial items. Ask your distributor or write for catalog.



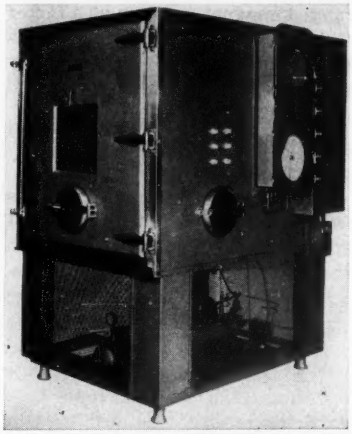
THE BUNTING BRASS & BRONZE COMPANY • TOLEDO 1, OHIO • BRANCHES IN PRINCIPAL CITIES

ing subsequent units by comparative reading. Optional accessory item permits application as a surface gage.

Humidity Testing Cabinet

USE REPLY CARD—CIRCLE No. 11

Murphy & Miller, 1326 S. Michigan Ave., Chicago, offers its humidity testing cabinet with 27-cu ft working area. Cabinet will supply relative humidity between 20 and 95 per cent in a temperature



. . . eliminates condensation during test

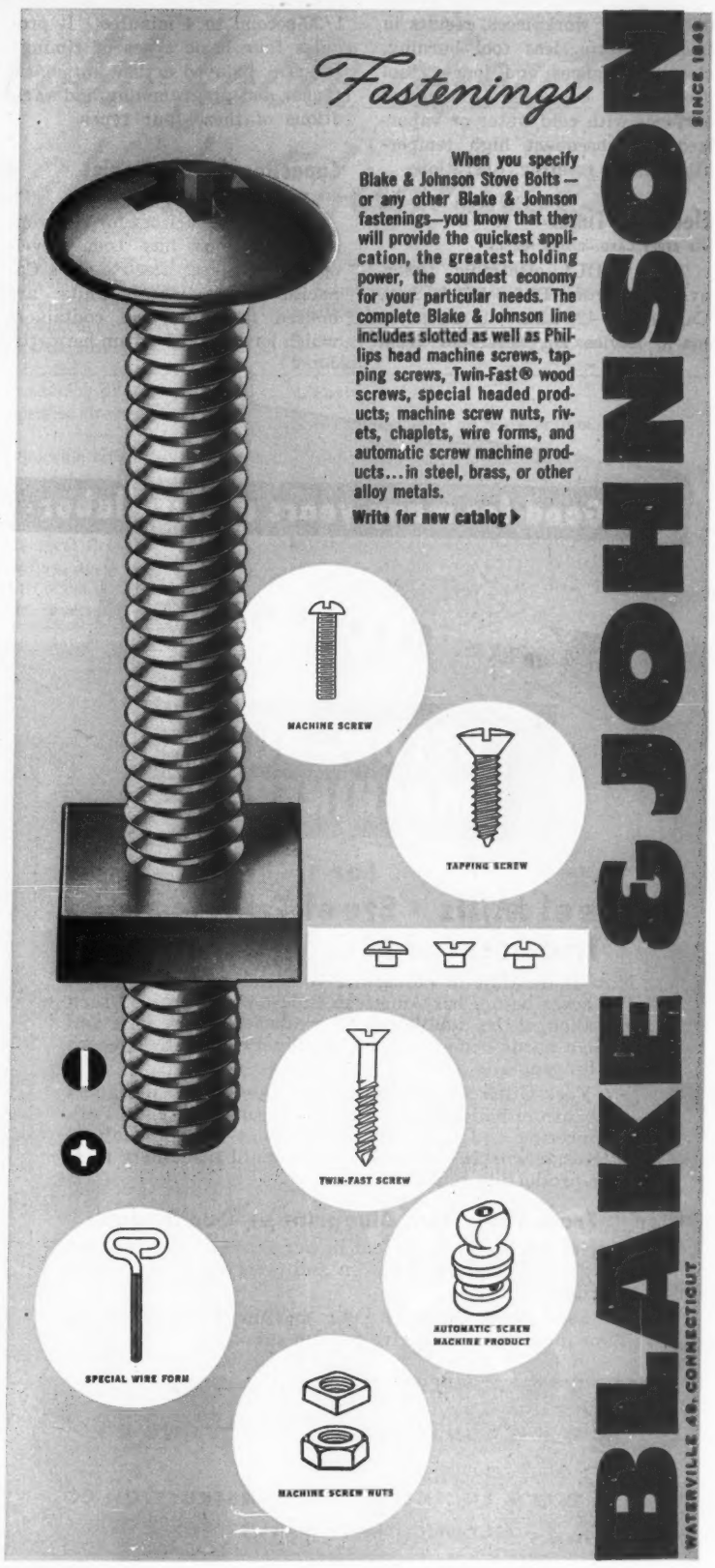
range from 35 to 185°F. Two advantages attributed to the unit are faster temperature regulation throughout its range and elimination of damaging condensation caused by changing temperatures during the course of a test.

To gain fast and accurate regulation, the cabinet is equipped with a hermetically-sealed refrigeration unit and an electric heating system. These quickly lower or raise interior temperatures to precise degree required. A high capacity condensing system that anticipates and prevents condensation forming on the equipment being tested is the factor that cuts damage from temperature change.

Synthetic Cutting Fluid

USE REPLY CARD—CIRCLE No. 12

Uncon cutting fluid H-660, a synthetic cutting fluid that forms a clear solution with all proportions of water at room temperature, is announced by Carbide & Carbon Chemicals Co., division of Union Carbide & Carbon Corp., New York 17, N. Y. Its use pro-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When you specify Blake & Johnson Stove Bolts — or any other Blake & Johnson fastenings—you know that they will provide the quickest application, the greatest holding power, the soundest economy for your particular needs. The complete Blake & Johnson line includes slotted as well as Phillips head machine screws, tapping screws, Twin-Fast® wood screws, special headed products; machine screw nuts, rivets, chaplets, wire forms, and automatic screw machine products... in steel, brass, or other alloy metals.
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duces cooler workpieces, results in faster cutting, less tool burning, closer tolerances and longer tool life. It can be rinsed from metal surfaces with cold water or vaporized in subsequent high temperature heat treating operations.

Electronic Timer

USE REPLY CARD—CIRCLE No. 13

Type 30HL1 electronic timer, available from Photoswitch Inc., Cambridge 42, Mass., is an automatic device for intervals from 1/20-second to 4 minutes. It provides four basic types of timing: Interval, delayed action, automatic repeat and programming and variations of these four types.

Capacitors for Electronics

USE REPLY CARD—CIRCLE No. 14

A line of capacitors for electronic applications has been developed by General Electric Co.'s Capacitor Department. Units are housed in drawn-oval containers which have a single seam hermetically sealed by double-rolling. Ratings are 2.0 muf to 10.0 muf, 600 to 1500 v, dc and 330 to 660 v, ac.

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Now is the time to modernize your industrial machinery. For never before has American industry encountered such a challenge! Its double job of producing for defense and civilian needs demands plant machinery built stronger, to last longer.
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Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.
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and
YORK ENGINEERING & CONSTRUCTION CO.
951 Penn Avenue, Pittsburgh 22, Pa.

Unit Protected from Overrange

USE REPLY CARD—CIRCLE No. 15

Smith magnetic or eddy current type hand tachometer is available with a limit stop to protect it against overrange. Distributed by Equipoise Controls Inc., Bronxville, N. Y., the unit's limit stop establishes a fixed arc through which drag cup can travel. When overranged, magnet revolves at a faster speed inside cup and drag cup is held firmly against limit stop by higher induced magnetic torque.

Speed Measuring Heads

USE REPLY CARD—CIRCLE No. 16

Heavy duty tachometer heads for measuring a wide range of speeds are available from Metron Instrument Co., Denver 9, Colo. Speeds between 200 and 10,000 rpm for full scale indication are measured and heads can be overspeeded two to ten times with no damage resulting. All heads of same type number are interchangeable.

Air Control Valve

USE REPLY CARD—CIRCLE No. 17

Hannifin Corp., Chicago 24, Ill., announces the P-M Pilot-Master valve for directional control of air pressure. Main valve portion can be operated either two-way or three-way normally open to pressure or normally closed to pressure without any internal change. Piston-poppet assembly is the only moving part included in the main valve.

Protects Precision Parts

USE REPLY CARD—CIRCLE No. 18

Rust inhibitor, offered by Crown Industrial Products Co., Sycamore, Ill., may be applied to wet, damp or moist surface of precision parts. It is an animal fat base product that has some lubrication qualities. The nontoxic and noninflammable product is available in a spray container or in bulk.

Copper-Silver Bronze

USE REPLY CARD—CIRCLE No. 19

A high strength copper-silver bronze with high electrical conductivity, developed by Handy & Har-

The hard, cold facts about Pittsburgh's hot furnaces!

47 PLANTS OKAY THE HEAT PROVER

Pittsburgh's great steel industry needed an instrument to measure air infiltration, to check air requirement and fuel-air ratio controls in open-hearth furnaces . . . an instrument to check the stoves in which blast-furnace air is heated . . . to check precise atmospheres in soaking pits . . . to control fuel waste and precise atmospheres in processing furnaces.

THE CITIES SERVICE HEAT PROVER WAS THE ANSWER . . . and it received the stamp of approval from engineers in 47 different mills in and around Pittsburgh!

Cities Service Heat Provers . . . *not an instrument you buy, but a service we supply* . . . helped to boost furnace productivity through these five unique advantages:

1. Rapid continuous sampling.

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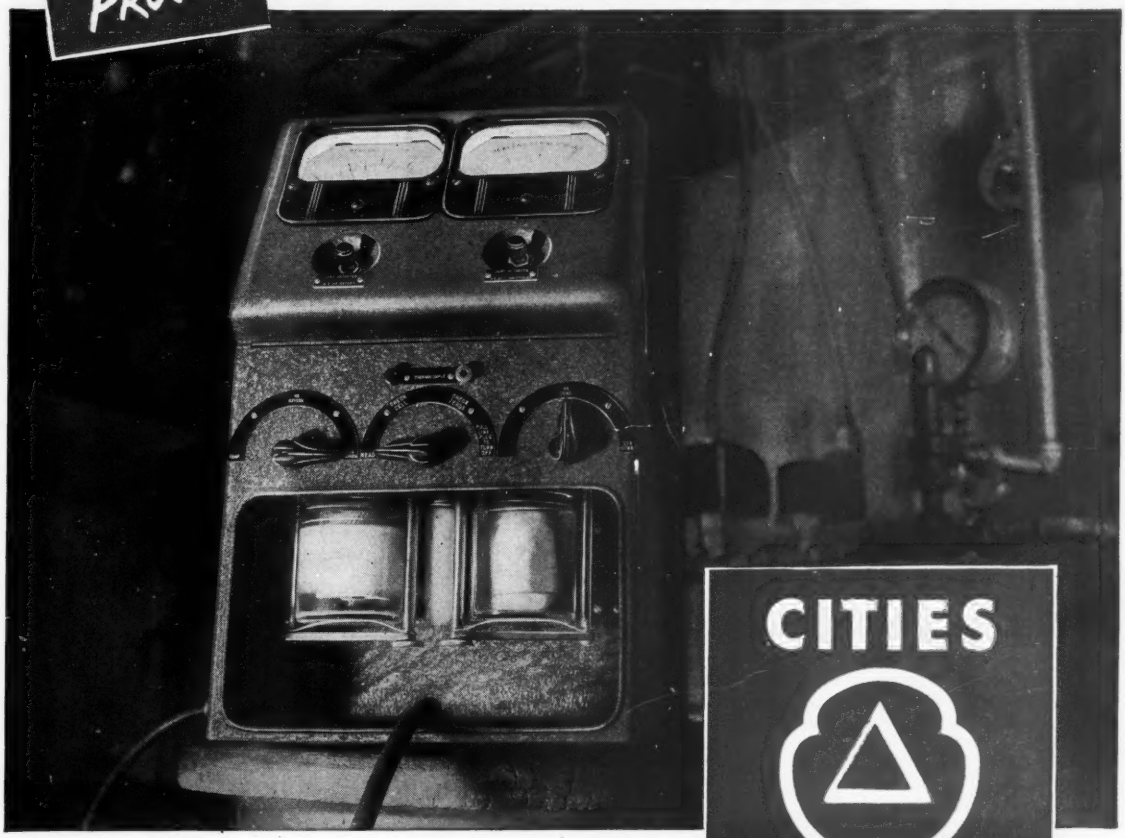
4. Easy portability.

5. No maintenance; no re-calibration.

These points begin to tell you why Cities Service Heat Prover analyses are just as much favored in glass, ceramics, steam generation and other fields as in the great Pittsburgh steel area. For the full story as it applies to you, write CITIES SERVICE OIL COMPANY, Dept. F24, Sixty Wall Tower, New York City 5.



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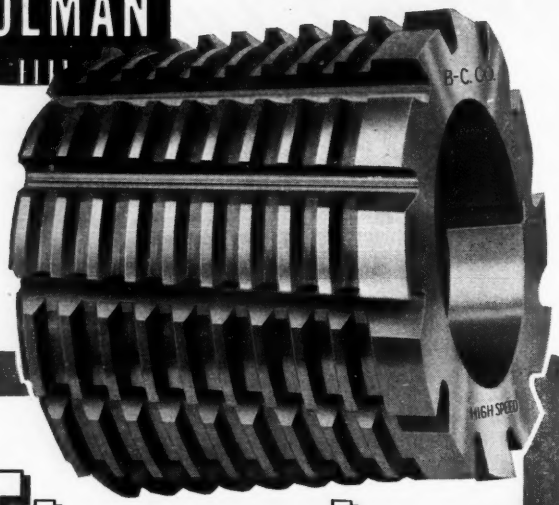

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Ask our engineers to quote limits of accuracy and production estimates, using ground or unground, straight or helical fluted thread milling cutters for your applications.

BARBER-COLMAN COMPANY
886 ROCK STREET
ROCKFORD, ILLINOIS

man, New York 38, N. Y., contains 94 per cent copper and 6 per cent silver. It is available in the heat treated and cold worked condition. It is made in rounds 0.160-inch diameter down to fine gages of magnet wire and in flat wire of equivalent cross section area having a maximum width of ½-inch.

Rotates Large Diameters

USE REPLY CARD—CIRCLE No. 20

Model X-20115 Big Hole turntable, announced by Aronson Machine Co., Arcade, N. Y., may be mounted on a bench, the floor or a pit to rotate heavy large diameters on the horizontal plane for welding, painting, cleaning, etc. With 9-inch hole in the center, spindle shafts can be positioned without special fixtures.

Flux for Gas Welding

USE REPLY CARD—CIRCLE No. 21

No. 35 aluminum welding and stainless steel flux is offered by All-State Welding Alloys Co. Inc., White Plains, N. Y. Developed for the company's X-2S and X-43S aluminum rods, it does not flake off and leave surface unprotected causing rough bubbly weld. It spreads thinly and evenly ahead of flame.

Demonstration Unit for Brakes

USE REPLY CARD—CIRCLE No. 22

A desk-top demonstration unit for electric brakes and clutches is introduced by Warner Electric Brake & Clutch Co., Beloit, Wis. It reproduces in miniature the exact action of electric brakes and clutches for industrial machinery of all types.

Motor Has Short Overall Length

USE REPLY CARD—CIRCLE No. 23

Wafer motors, developed by Reuland Electric Co., Alhambra, Calif., feature short overall length and are suited to applications re-

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71. Metal Working Waxes

S. C. Johnson & Sons, Inc.—Story of Johnson's wax lubricants and their increasing use in drawing and forming, impact extrusion, cold heading, drilling, reaming, piercing, blanking, cutting, sawing, routing and other metalworking operations is told in 20-page illustrated booklet. Five lubricant products are described and basic requirements for good lubrications are outlined.

72. Die Casting Machines

Lake Erie Engineering Corp.—Features of Lake Erie die casting machines, available in ten models from 100 to 1000-ton capacity, include Wedge Cam Toggle and Pressure Pac, an automatic pressure booster. These features, and others, plus specifications, are detailed in 6-page illustrated folder 23.1.

73. Paint Stripper

Klem Chemicals Inc.—Data on the new Strip-Aid for easy removal of paints, enamel and lacquers are given in 4-page illustrated bulletin. Added in ratio of 1 part in 9 to alkaline stripper, this material assures complete finish removal. Residual pigments rinse off immediately without scrubbing.

74. Galvanometers, Etc.

Leeds & Northrup Co. — 20-page illustrated catalog section ED contains data on line of standard galvanometers, dynamometers, direct current indicating amplifiers and accessories for use in null balance or calibrated deflection measurements. Low level dc indicating amplifiers are also covered. Included are galvanometer selection guide, diagrams and complete specifications.

75. Ventilator Fabrication

Burt Mfg. Co.—In celebration of their 50th anniversary, company has published 24-page brochure which cites its historical highlights; pictures and describes its gravity and fan ventilators, wall louvers, oil filters, exhaust heads and sheet metal specialties; and illustrates its plant engineering and testing facilities. List of sheet metal fabricating equipment is included.

76. Materials Handling Truck

Kwik-Mix Co.—Low cost materials handling with gasoline engine powered Moto-Bugs is demonstrated pictorially in 4-page bulletin KM328. This versatile unit can be equipped with 10-cu ft dumping hopper, 1500-lb capacity platform, 1000-lb capacity fork lift attachment or with 5-ft scraper blade for spreading, snow plowing and scraping operations.

77. Electrical Equipment

Electric Equipment Co. — 16-page illustrated catalog is partial "Stock List" of new and rebuilt alternating and direct current motors, generators, transformers, oil switches, air breakers, control equipment, compensators, capacitors, compressors, safety switches, platers and frequency changers.

78. Shear, Punch & Coper

Kling Bros. Engineering Works — "Kling Combination Shear, Punch and Coper" is title of 12-page illustrated bulletin which describes various sizes of this machine and explains its use for punching, shearing, cutting, mitering, coping and notching angles, bars; plate, strip, rounds, beams and other metal shapes.

79. Castings Reference Charts

Lebanon Steel Foundry—Specification designations, analyses, physical properties and heat treatments for 32 Circle L casting materials are included in two 4-page reference charts. One covers stainless, corrosion and heat resistant alloys, while other is on other carbon and low alloys.

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80. Lathes & Shapers

Logan Engineering Co.—You'll find detailed descriptions with full specs on 11 and 10-in. screw cutting, gear and turret lathes in 16-page illustrated form CC7 entitled "Better Lathes and Shapers." Hand screw machine, 8-in. shaper, as well as chucks, collets, collet attachments and other lathe accessories are covered also.

81. Tank Heating & Cooling

Kold-Hold Mfg. Co.—6-page illustrated folder IP-251 explains advantages offered by use of Platecoil heat exchanger elements for any operations involving heating or cooling of materials in tanks. These flat embossed units are easily installed and are simple to maintain. Application data are given.

82. Drilling, Tapping Machines

Kaukauna Machine Corp. — Specifications and engineering data on complete line of stationary and portable universal and horizontal drilling and tapping machines are given in 12-page illustrated catalog. Machines are capable of performing vertical, angular, compound angular and horizontal drilling, tapping, boring, counterboring, spotfacing and reaming operations on workpieces of any size or shape.

83. Bonding Mortars

Laclede-Cristy Co.—20-page illustrated and indexed bulletin No. 42 has sections devoted to purpose and selection of refractory cements and mortars, preparation and mixing. Purpose, processing, features, uses, packaging and other information is given for each type of product. How-to and application photos are included.

84. Shock Resisting Die Steel

Latrobe Electric Steel Co.—Hardening and tempering data, typical uses, recommendations for working and available forms of MGR air-hardening shock-resisting die steel are contained in 4-page data sheet. Information on analysis is presented, as is listing of other steels for various uses.

85. Electronic Wattmeter

Keithley Instruments—Nine ranges permit precise reading from 0.03 to 300 w on model 109 electronic wattmeter, described and illustrated in 2-page bulletin. It is useful where a high input impedance or sensitivity to low voltage and low power circuits is required and has frequency response of 20 to 3000 cps. Suggested uses and specifications are included.

86. Lead Clad Steel & Copper

Knapp Mills. Inc.—24-page illustrated technical treatise is entitled "The History and Development of Ferrolum Lead Clad Steel and Cupralum Lead Clad Copper." Solutions to corrosion problems in manufacture, storage, transportation and processing of various materials are offered.

EDITORIAL REPRINTS:

87. Aluminum Alloys

"Aluminum Alloys: Automakers May Use More" is title of STEEL reprint which points to some of the increasing applications of aluminum alloys in the automotive industry. Authors J. H. Dunn and E. P. White discuss brazed aluminum castings, brazing iron to aluminum, die casting for stressed applications, plaster process castings, alloys for radiators and alloys for finishes.

88. Corrosion and Fretting

What's the truth about fretting or fretting corrosion as it is often called? New studies show that this failure in metal surfaces is principally physical in nature. Any chemical reaction is secondary. Problem is discussed in STEEL reprint of article headlined "Corrosion Problem Really Physical Change" as well as the type of lubrication which can ease the problem.

89. Quality Control

Are you stumped by stiff government specifications in your contract? If so, there's a right and a wrong way to set up a quality control system. C. W. Kennedy, in STEEL reprint "Quality Control—You'll Need a System" describes one way to do it that works. System is method used by Pantex Mfg. Co. in making large caliber machine gun bullet components.

90. Blast Furnace Practice

In highly informative STEEL reprint entitled "Blast Furnace Practice . . . X-Beneficiation of Raw Materials" C. E. Agnew, consultant for blast furnace and sintering plant operations, Cleveland, discusses sintering, nodulizing, briquetting and pelletizing processes for treating natural iron ores, ore concentrates and flue dust. He tells why these processes have become a commercial necessity.

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quiring a totally enclosed, air cooled unit with flat design. It is available in ratings from 1/20 through 5 hp and in speeds from 450 to 3600 rpm, single phase or polyphase.

Air Line Filters

USE REPLY CARD—CIRCLE No. 24

C. A. Norgren Co., Englewood, Colo., announces a filter for removal of corrosive moisture, abrasive pipe scale and other foreign matter from ¾ and 1-inch compressed air lines. It is for use on air flows from 0 to 140 cfm at pressure of 0 to 150 psi and temperatures between 40 and 120° F. Transparent plastic bowl enables you to see when to drain. Filter is fully automatic and requires no adjustments.

Three Spindle Turret Head

USE REPLY CARD—CIRCLE No. 25

A three spindle turret head that can be attached to any drill press and permits sequence drilling, countersinking and tapping on a single drill press spindle, is introduced by Commander Mfg. Co., Chicago, Ill. Select-A-Spindle provides a selection of speeds on each spindle for drilling, reaming, counterboring and tapping at recommended speeds. Capacity on all three spindles is ⅜-inch.

Wire Strippers

USE REPLY CARD—CIRCLE No. 26

Lonco wire strippers, introduced by London Chemical Co. Inc., Chicago 16, Ill., are designed for stripping at room temperature of Nyclad, Formex, Formvar, vinyl and enamel insulated wires by company's stripping process. Process eliminates wiping rags, drag-out losses, etc. Vapor pressure has been controlled to the point where it is possible to strip to any desired closeness without fear of electrical leakage.

USE A REPLY CARD

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Run an abrasive belt over a right-angle stationary guide at 4000 feet per minute . . . smooth and polish a small, recessed area on thousands of precision-made automatic pistol stocks . . . *and still eliminate excessive belt breakage!* This was an actual problem that confronted one prominent manufacturer. Here's how Jewel Brand Abrasive Engineers helped solve it.

A small sample of scrap abrasive belting was picked at random from the plant waste barrel. This was carefully analyzed by experienced Jewel Brand Engineers. It was fully tested in terms of the type of product being finished and the material used. Then, basing their selection on the findings of the "Waste Barrel" Test combined with basic information on the job requirements, these same qualified engineers recommended a Jewel Brand Abrasive Belt that has not only eliminated excessive belt breakage but one that has consistently done a better job, faster and *at a lower cost.*

This is only one of many difficult finishing problems quickly and effectively solved by Jewel Brand Engineers. It could just as well be *your* problem . . . your plant . . . your savings! So whatever your finishing operation may be we urge you to make the easy, profitable "Waste Barrel" Test now. Simply cut out a letter-size sample of used abrasive belt . . . include the belt joint, if possible . . . and send together with completed coupon. We'll do the rest *at no obligation to you.*

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Mass.

HELP me complete the Waste Barrel Test!
Enclosed is a sample of used belt from our plant.

NAME _____ POSITION _____

COMPANY _____

ADDRESS _____

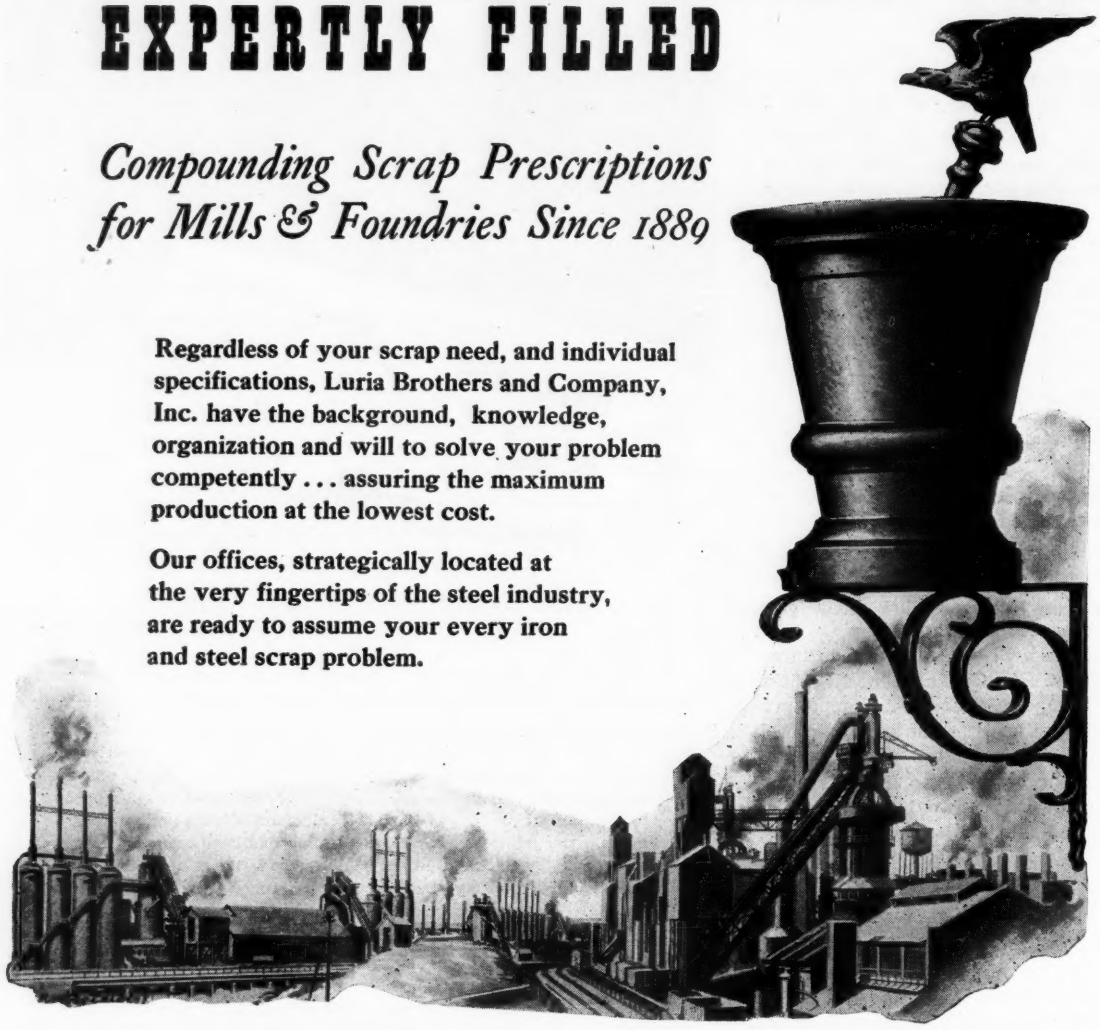
TYPE OF PRODUCTS _____ MATERIAL _____

WE USE APPROXIMATELY _____ BELTS PER MONTH _____

BELT LENGTH _____ BELT WIDTH _____

SCRAP PRESCRIPTIONS EXPERTLY FILLED

Compounding Scrap Prescriptions for Mills & Foundries Since 1889



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

UNCERTAINTY is mounting in the steel markets as midyear approaches. The pulling and hauling attending the play of opposing influences in a highly sensitive economy are making for indecision in business circles on a widening scale. This is being translated into increasing buying hesitancy, even order cancellations, and accompanying sluggishness in various areas of production and consumption.

FUTURE'S KEY—The Supreme Court's delay in ruling on the legality of President Truman's steel plant seizure in the wage-price dispute is a potent force for caution in determining current business policies. Until this issue is conclusively disposed of there is little likelihood a clear-cut pattern in the steel and metalworking industries will emerge from the present fog of uncertainty. This issue holds the key to immediate future policy-making both for management and labor.

NEW THREAT—Renewed threat of a serious explosion in Europe adds to the confusion. With East German communists shaking an angry fist at the West in protest against the Bonn treaty linking West Germany with the free world, a highly unsettling politico-economic note of grave import is injected into the over-all situation. Further deterioration of relations in this area conceivably could tighten quickly the now relaxing hand of government bureaucracy on the economy.

ACTIVE QUARTER—In existing circumstances the mixed sentiment in the steel markets is understandable. Barring labor trouble following the Supreme Court's ruling in the steel plant seizure case, producers of such major steel products as carbon bars, sheared plate, shapes, pipe and tubing, and hot and cold-rolled sheets anticipate an active third quarter. They hold heavy order backlogs in these products for the period. Gradual shaking down in demand is currently in evidence, however, with warm weather and vacations likely to exert an easing effect on consumer requirements.

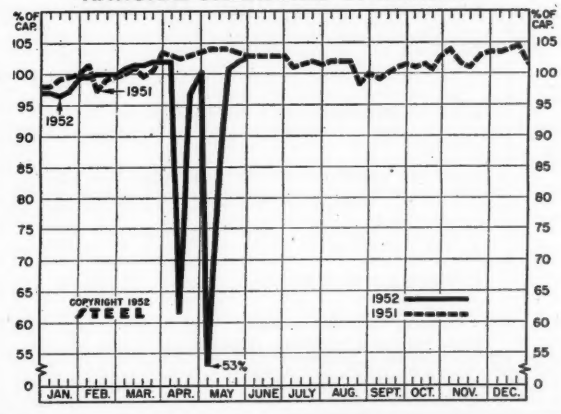
READJUSTMENTS—At present the steel producers anticipate some readjustments in third quarter rolling schedules should soft spots continue to appear in requirements for such products as wire, strip-plate, terneplate and various specialties. Despite the threat of steel labor trouble in the weeks ahead little in the way of protective buying has developed to date, except for possibly hot and cold-rolled sheets, and this latter largely on automotive account.

PRODUCT POSITION—Large-size bars continue in extremely short supply and give little promise of easing through remainder of the year. Smaller bars are more readily available than they were, but still are tight. Heavy plates are hard to get but light plates are increasingly plentiful. Structural shape supply is easier with building and railroad needs sagging. Producers are pinning hopes for sustained demand on revival in commercial building under relaxed government controls. Specialties are sluggish, noticeably silicon sheets. In general, prospects for further easing in demand are seen in slackening pressure for scrap, pig iron, coke and other raw materials, and the outlook for fourth quarter is hazy.

PRODUCTION—Under pressure to provide as much steel as possible as quickly as possible, the mills maintained a high rate of operations over the holiday weekend. Curtailments were limited to a few points. Estimated national ingot rate rose 1.5 points to 102.5 per cent, new high for the year.

PRICES—The Supreme Court's delay in handing down its opinion in the plant seizure case continues to forestall settlement of the price problem confronting the industry. Higher prices, however, are expected eventually. Meanwhile, STEEL's weighted index on finished steel holds at 171.92 while the arithmetical price composite is unchanged at $106.32. The steelmaking scrap composite is steady at $43. Signs of weakness are increasing in scrap.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 31	Change	Same Week 1951	Same Week 1950
Pittsburgh	104	+ 0.5	102	101.5
Chicago	105	0*	108	103.5
Mid-Atlantic	96	+ 2	101.5	98
Youngstown	105	0	105	106
Wheeling	96.5	— 1	98.5	108
Cleveland	103	— 3*	101.5	99
Buffalo	104	0	104	104
Birmingham	102	0	100	100
New England	75	+ 5	89	85
Cincinnati	94.5	0	104	104
St. Louis	93.5	+ 8.5	98.5	84.5
Detroit	110	0	107.5	104
Western	102.5	— 1.5	100.5	95
Estimated national rate	102.5	+ 0.5	103	101

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 55 *Production-Engineering News—p. 91*

Composite Market Averages

	May 29 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	29.92

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are base on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 29 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.252	4.252	4.223	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia ..	3.93	3.93	3.918	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh ..	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh ..	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ⅞-⅜", Pitts. ..	4.10–30	4.10–30	4.10–30	4.10–30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.75	56.75	56.61	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila. ...	57.25	57.25	57.11	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts....	$44.00	$44.00	$44.00	$45.00	$30.00
No. 1 Heavy Melt, E. Pa...	42.50	42.50	42.50	43.50	31.00
No. 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	28.75
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	31.25
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	30.75
No. 1 Heavy Melt, Buffalo.	43.00	43.00	43.00	44.00	33.00
Rails, Rerolling, Chicago ..	52.50	52.50	52.50	52.50	34.00
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	37.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connisvl. ..	$14.75	$14.75	$14.75	$14.75	$8.75–9.50
Beehive, Fdry, Connisvl. ..	17.50	17.50	17.50	17.50	9.75–11.00
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50-24.00
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	14.80	14.80	17.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	139.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	44.00	44.00	44.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
Alabama City,Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward,Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda,N.Y. W12	52.00	52.50	53.00	....
No.Tonawanda,N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester,N.Y., del.	54.88	55.38	55.88	....
Syracuse,N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00	....	52.50	....
IndianaHarbor,Ind. I-2	52.00	....	52.50	....
So.Chicago,Ill. W14	52.00	52.50	52.50	....
So.Chicago,Ill. Y1	52.00	52.50	52.50	....
So.Chicago,Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon,Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron,O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain,O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett,Mass. E1	....	59.75	60.25	....
Fontana,Calif. K1	58.00	58.50	....	....
Seattle,Tacoma,Wash., del.	....	60.66	....	....
Portland,Oreg., del.	....	60.66	....	....
LosAngeles,SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity,Ill. G4	53.90	54.40	54.90	....
St.Louis, del. (inc. tax).....	54.66	55.16	55.66	....
Ironton,Utah C11	52.00	52.50	....	....
Geneva,Utah C11	52.00	52.50	....	....
LoneStar,Tex. L6	48.00	*48.50	48.50	....
Minnequa,Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer,Pa. U5	52.00	....	52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00	....	....	....
McKeesport,Pa. N3	52.00	....	....	53.00
Monessen,Pa. P7	54.00	....	....	....
Sharpsville,Pa. S6	....	....	52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield,O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls,N.Y. P15	$88.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee,Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia delivered	63.55
Troy,N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, May 29, 1952; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ..$79.00
Munhall,Pa. U5 .....52.00
Seattle S24 .....73.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ...$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ...75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ...56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ...56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ...85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 ....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ...82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ..3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ...4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ...4.90
Worcester,Mass. A7 ...4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 .3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ...4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ...4.85
Phoenixville,Pa. P4 ...5.90
Portland,Oreg. O4 ....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14.3.65
So.SanFrancisco B3 ...4.20
Torrance,Calif. C11 ...4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 .5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ...5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 ....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., LA. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ...5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 .3.95
Ashland,l.c.l. (15) A10..4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
Los Angeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity, Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 ....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ..5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 .....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn.W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrght.Iron) U1 .12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 ....3.70

BARS, Reinforcing (Fabricators)
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ...4.75
Los Angeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ..4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Ashland,Ky.(8) A10 ...3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit, M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah C11 .....3.70
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ..3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ..3.75
Youngstown U5, Y1 .....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 ....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ...5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.85
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu	Cu
	Alloy	Fe
Ashland,Ky. A10.	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2.	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16.	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths 1½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va.W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
SoSanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N. J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
New York W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	S15 10.75
Carnegie,Pa.	S18 ....10.60
Cleveland A7	....10.00
Dover,O. G6	....10.50
Fontana,Calif. K1	....11.65
Harrison,N.J. C18	....10.60
Midland,Pa. C18	....10.60
NewBritn,Conn.(10)	S15 10.75
Pawtucket,R.I.(11)	N8..10.75
Pawtucket,R.I.(12)	N8..11.05
Sharon,Pa. S3	....10.60
Worcester,Mass. A7	...10.30
Youngstown C8	....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8)	A10 ...3.75
Warren,O. R2	....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	....5.25

TIGHT COOPERAGE HOOP

Atlanta A11	....4.05
Riverdale,Ill. A1	....3.90
Sharon,Pa. S3	....4.15
Youngstown U5	....3.75

WIRE, Tire Bead

Bartonville,Ill.(1)	K4 ..10.90
Monessen,Pa. P16	....11.40
Roebling,N.J. R5	....11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)	N15 5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Muncie,Ind. I-7	8.75	9.00
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	..4.85
Aliquippa,Pa. J5	....4.85
Atlanta A11	....5.10
Alton,Ill. L1	....5.05
Bartonville,Ill.(1) K4	..4.85
Buffalo W12	....4.85
Chicago W13	....5.10
Cleveland A7, C20	....4.85
Crawfordsville,Ind. M8	..5.10
Donora,Pa. A7	....4.85
Duluth,Minn. A7	....4.85
Fairfield,Ala. T2	....4.85
Fostoria,O.(24) S1	....5.35
Houston S5	....5.25
Johnstown,Pa. B2	....4.85
Joliet,Ill. A7	....4.85
KansasCity,Mo. S5	....5.45
Kokomo,Ind. C16	....4.95
LosAngeles B3	....5.80
Minnequa,Colo. C10	....5.10
Monessen,Pa. P7	....5.10
Newark 6-8 ga. I-1	....5.50
No.Tonawanda B11	....4.85
Palmer,Mass. W12	....5.15
Pittsburg,Calif. C11	....5.80
Portsmouth,O. P12	....5.25
Rankin,Pa. A7	....4.85
So.Chicago,Ill. R2	....4.85
So.SanFrancisco C10	...5.80
SparrowsPoint,Md. B2	..4.95
Sterling,Ill.(1) N15	....4.85
Struthers,O. Y1	....4.85
Torrance,Calif. C11	....5.80
Waukegan,Ill. A7	....4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	....6.20
Buffalo W12	....6.35
Cleveland A7	....5.85
Crawfordsville,Ind. M8	..6.20
Detroit D2	....6.20
Dover,O. G6	....6.20
Fostoria,O. S1	....6.00
Kokomo,Ind. C16	....5.70
FranklinPark,Ill. T6	..6.20
Massillon,O. R8	....5.85
Monessen,Pa. P16	....5.85
Monessen,Pa. P7	....6.10
NewHaven,Conn. D2	...6.50
Pawtucket,R.I.(12)	N8..6.85
Trenton,N.J. R5	....6.15
Worcester,Mass. A7	....6.15
Worcester,Mass. T6	....6.50
Worcester,Mass. W12	..6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	....8.50
Monessen,Pa. P16	....8.50
Muncie,Ind. I-7	....8.70
Roebling,N.J. R5	....8.80
SparrowsPoint,Md. B2	..8.60
Johnstown,Pa. B2	....8.50

WIRE (16 gage)	An'l'd Stone	Galv. Stone
Aliquippa J5	...10.15	12.15
Bartonville(1)K4	.10.25	11.95
Cleveland A7	...10.25	12.15
Crawfrdsville M8	..10.30	12.00
Fostoria,O. S1	..10.40	13.00
Johnstown B2	...10.25	12.15
Kokomo C16	...10.25	11.96
Minnequa C10	..10.40	12.40
Palmer,Mass.W12	.10.25	12.15
Pitts.Cal. C11	...10.60	12.50
Prtsmth.(18) P12	.10.55	12.30
SparrowsPt. B2	..10.35	12.25
Waukegan A7	...10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	....6.25
Alton,Ill. L1	....6.45
Bartonville,Ill.(1) K4	..6.25
Buffalo W12	....6.25
Cleveland A7	....6.25
Donora,Pa. A7	....6.25
Duluth,Minn. A7	....6.25
Fostoria,O. S1	....6.25
Johnstown,Pa. B2	....6.25
LosAngeles B3	....7.20
Milbury,Mass.(12) N6	..8.05
Monessen,Pa. P7, P16	..6.25
Muncie,Ind. I-7	....6.45
Palmer,Mass. W12	....6.55
Pittsburg,Calif. C11	....7.20
Roebling,N.J. R5	....6.55
Portsmouth,O. P12	....6.25
So.Chicago,Ill. R2	....6.25
So.SanFrancisco C10	...7.20
SparrowsPoint,Md. B2	..6.35
Struthers,O Y1	....6.25
Trenton,N.J. A7	....6.55
Waukegan,Ill. A7	....6.25
Worcester A7, T6, W12	..6.55
Worcester,Mass. J4	....6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	...8.90
Buffalo W12	....8.90
Chicago W13	....8.90
Cleveland A7	....8.90
Crawfordsville,Ind. M8	..8.95
Fostoria,O. S1	....8.90
Johnstown,Pa. B2	....8.90
Kokomo,Ind. C16	....8.90
Monessen,Pa. P16	....8.90
Muncie,Ind. I-7	....9.10
Palmer,Mass. W12	....9.20
Portsmouth,O. P12	....8.90
Roebling,N.J. R5	....9.20
Waukegan,Ill. A7	....8.90
Worcester,Mass. A7, T6	.9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	...137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	..146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	..148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	..161
SparrowsPoint,Md. B2	..143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	..123
Crawfordsville,Ind. M8	..132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	..147
SparrowsPoint,Md. B2	..125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	....5.90
Alton,Ill. L1	....6.10
Buffalo W12	....5.90
Cleveland A7	....5.90
Donora,Pa. A7	....5.90
Duluth,Minn. A7	....5.90
Johnstown,Pa. B2	....5.90
LosAngeles B3	....6.85
Monessen,Pa. P7, P16	..5.90
NewHaven,Conn. A7	...6.20
Palmer,Mass. W12	....6.20
Pittsburg,Calif. C11	....6.85
Portsmouth,O. P12	....5.90
Roebling,N.J. R5	....6.20
So.Chicago,Ill. R2	....5.90
So.SanFrancisco C10	...6.85
SparrowsPoint,Md. B2	..6.00
Torrance,Calif. C11	....6.85
Trenton,N.J. A7	....6.20
Waukegan,Ill. A7	....5.90
Worcester,Mass. A7	....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	...127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	...131
Crawfordsville,Ind. M8	..133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	...205
Johnstown,17ga.,4" B2	..208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	..138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	..140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	....9.85
Lebanon,Pa.(31) B2	....9.85
Minnequa,Colo. C10	....9.85
Pittsburgh O3, P14	....9.85
Seattle B3	....10.35

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	...	3.50	...	4.00
Minnequa,Colo. C10	...	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	...118
Aliquippa,Pa.(13) J5	...118
Atlanta A11	121
Bartonville,Ill.(19) K4	...118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	...122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	122
Monessen,Pa. P7	124
Pittsburg,Calif. C11	127
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	...120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	..$7.35
Wheeling,W.Va. W10	...7.35

TIE PLATES

Fairfield,Ala. T2	....4.50
Gary,Ind. U5	....4.50
Ind.Harbor,Ind. I-2	....4.50
Lackawanna,N.Y. B2	..4.50
Minnequa,Colo. C10	....4.50
Pittsburg,Calif. C11	....4.65
Seattle B3	....4.65
Steelton,Pa. B2	....4.50
Torrance,Calif. C11	....4.65

JOINT BARS

Bessemer,Pa. U5	....4.70
Fairfield,Ala. T2	....4.70
Ind.Harbor,Ind. I-2	....4.70
Joliet,Ill. U5	....4.70
Lackawanna,N.Y. B2	..4.70
Minnequa,Colo. C10	....4.70
Steelton,Pa. B2	....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	..6.15
KansasCity,Mo. S5	....6.40
Lebanon,Pa. B2	....6.15
Minnequa,Colo. C10	....6.15
Pittsburgh J5	....6.15
Seattle B3	....6.65
So.Chicago,Ill. R2	....6.15
Struthers,O. Y1	....6.15
Youngstown R2	....6.15

AXLES

Ind.Harbor,Ind. S13	...5.60
Johnstown,Pa. B2	....5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.505
18	4	2	....		1.650
20	4.25	1.6	12.25	3.53	5.675
19	4	2	7		2.460
18.25	4.25	1	4.75		2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.6025
W	Cr	V	Mo		
6.4	4.5	1.9	5		0.96-0.965
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(31) New Haven, Conn., base.
(32) Del. San Francisco Bay area.
(33) 28 Ga. 36" wide.
(34) Deduct 0.20c, finer than 15 Ga.
(35) Bar mill bands.
(36) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(37) Bar mill size.
(38) Bonderized.
(39) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.

if you're slowed down by specialty steel shortages —

There's no need to wait around for specialty steel . . . you can find it at your Crucible Warehouse!

That's because we have been able to maintain good stocks of most of our more than 400 steels, despite industry shortages. Moreover, in tool steel, we have *complete* stocks available.

You'll get your Crucible steel quickly, too. One of our many strategically-located warehouses is bound to be within easy delivery distance of your plant.

So when next you need specialty steel, don't wait—pick up your phone . . . and call Crucible!

Stocks maintained of:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . AISI Alloy, Max-el Machinery, Onyx Spring and Special Purpose Steels

CRUCIBLE first name in special purpose steels

52 *years of* Fine *steelmaking* **WAREHOUSE SERVICE**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".
Columns B & E: Sparrows Point, Md. B2.
Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.
Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1¼", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.
Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.
Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates—Carbon Base 10%	Plates—Carbon Base 20%	Strip—Cold-Rolled Carbon Base 10%	Strip—Cold-Rolled Carbon Base Both Sides	Sheets—Carbon Base 10%	Sheets—Carbon Base 20%	Sheets—Cu Base Both Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....	....
Inconel.	41.23	54.18	....	....	....	....	165.00
Monel..	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C 22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)
6 in. and shorter:
½-in. & smaller diam. 15
⅝-in. & ⅝-in. 18.5
¾-in. and larger ... 17.5
Longer than 6 in.:
All diams. 14
Lag bolts, all diams.:
6 in. and shorter.... 23
over 6 in. long..... 21
Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up Bolts 31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅝-in..	12	6.5
¾-in.-1½-in. ..	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in. .	16.5	6.5
¾-in.-1½-in. ..	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in..	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
⅝-in. & ⅝-in. ..	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger..	13	8.5
		Light
⅞-in & smaller		35
⅛-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS
(F.o.b. plant; per cent off list in packages)
Plain finish .....48 & 10
Plated finishes .....31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged: per cent off list)
6 in. or shorter:
⅝-in. & smaller 42
¾-in. through 1 in... 34
Longer than 6 in.:
⅝-in. & smaller 26
¾-in. through 1 in... 4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)
1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS
(Packaged; per cent off list)
No. 10 and smaller ... 35
¼-in. diam. & larger.. 16
N.F. thread, all diams. 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus $1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	26.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.
Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Massillon, O., all items, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Muncie, Ind., wire I-7 quotes types 302, 304, 430.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.
Youngstown, strip except Types 303, 309, 316, 416 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol...25.00-33.50

Per ton bulk ovens
Sulphate of ammonia..$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron 98+% Fe, carlots..	17.00
Swedish, c.i.f New York, in bags..8.85-9.95	
Electrolytic iron: Annealed, 99.5% Fe.	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..83.00-148.00	
Aluminum: Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots..30.00-33.25	
Bronze, 10-ton lots 51.25-60.00	
Phosphor - Copper, 20-ton lots	50.00
Copper: Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium 75.00-85.00	
Manganese: Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302 ...	83.00
Zinc, 10-ton lots..25.00-32.50	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over....	6.00
Less than 1000 lb ..	6.15
98.8% minus 65 mesh: 1000 lb and over....	4.15
Less than 1000 lb...	4.25
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvil.fur.	$14.50-15.00
Connellsvil.fdy.	17.00-18.00
New River foundry...	21.30
Wise county, foundry..	15.95
Wise county, furnace.	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens.	$22.75
Everett, Mass., ovens New England, del...	*24.80
Chicago ovens ..... Chicago, del.	23.00 24.50
Terre Haute, ovens....	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens ... Chicago, del. ..... Cincinnati, del. .... Detroit, del.	22.75 26.42 25.85 26.85
Ironton, O., ovens .... Cincinnati, del.	22.50 25.12
Painesville, O., ovens.. Cleveland, del.	24.00 25.82
Erie, Pa., ovens	23.50
Birmingham, ovens .. Birmingham, del. ..	20.30 21.60
Philadelphia, ovens ...	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens.	22.60
St. Louis, ovens St. Louis, del.	25.40
Portsmouth, O., ovens Cincinnati, del.	22.50 25.12
Detroit, ovens ..... Detroit, del. ..... Buffalo, del. ..... Flint, del. ..... Pontiac, del. ..... Saginaw, del.	24.00 25.00 26.89 26.59 25.47 26.92

* Or within $4.55 freight zone from works.

Every Man, Woman and Child in the U.S.A. Can Go Riding at the Same Time

In the U.S.A., competition is basically responsible for better cars at lower comparative cost. We enjoy the use of three times as many cars—and annually produce four times as many cars—as the rest of the world put together. There are approximately 43 million autos—and 9 million trucks and buses—in use in the U. S. A. today. That's more than enough to take everyone riding at the same time.

By stimulating the sale of the new and the resale of the old, our competitive system achieves widespread ownership of automobiles, as with almost everything else. In most foreign countries, out of necessity people make things last as long as possible. In the U. S. A., vigorous competition prompts improvement, refinement and continuous progress. Buyers of new cars get maximum value, because each manufacturer competes actively for the new-car dollar. Lowest-income groups benefit by the lowered prices of used, yet essentially useful, products. Overall result: Steady jobs, good wages and the world's highest standard of living. In most of the rest of the world, luxuries come within reach of only the rich. In the United States, the irresistible drive of competition invents, mass-produces, advertises, distributes and sells—so that most of the miraculous products of modern living are within the reach of all.

Free competition—like freedom of speech, press and religion—is a dynamic part of Uncle Sam's character. Let's keep it free, so that the U. S. A. continues to be the greatest country in the world.

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THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡[5]		Carbon	Floor
New York (city)	6.28	7.24	8.54	6.50	...	6.52	7.33	9.29	6.38	6.76	8.01
JerseyCty(c'try)	6.09	6.94	8.27	6.36	...	6.22	7.03	8.99	6.08	6.46	7.71
Boston (city) ..	6.40	7.20	8.63	6.32	...	6.25	7.24	10.80	6.40	6.60	7.84
Boston (c'try) .	6.20	7.00	8.43	6.12	...	6.05	7.04	10.60	6.20	6.40	7.64
Phila. (city) ..	6.04	6.97	8.35	6.29	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) .	5.79	6.72	8.10	6.04	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ..	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va..	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.46	6.06	...	5.72	6.65	10.72††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.26	5.86	...	5.52	6.45	10.52††	5.82	5.98	7.35
Pitts. (w'hse) .	5.54	6.32	8.25	5.84	6.90	5.47	6.40	10.10††	5.65	5.70	6.69
Detroit (w'hse).	5.74	6.49	8.55	5.78	7.15	5.76	6.60	10.37††	6.12	6.17	7.23
Cleveland (del.)	5.74	6.52	8.18	5.85	7.14	5.81	6.60	10.41††	6.18	6.02	7.43
Cleve. (w'hse) .	5.54	6.32	7.98	5.65	6.94	5.61	6.40	10.21††	5.98	5.82	7.23
Cincin. (w'hse).	5.87	6.39	8.32	5.79	...	5.77	6.66	10.52††	6.12	6.17	7.31
Chicago (city) .	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.91	...	8.22	5.86	...	5.84	6.77	10.37††	6.02	6.07	7.26
Milwau. (c'try)	5.71	...	8.02	5.66	...	5.64	6.57	10.17††	5.82	5.87	7.06
St. Louis (del.)	6.04	6.82	8.35	5.99	...	5.97	6.90	10.60††	6.25	6.30	7.49
St. L. (w'hse) .	5.84	6.62	8.15	5.79	...	5.77	6.70	10.40††	6.05	6.10	7.29
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	9.18	9.65	7.55	...	6.80	9.14	10.35	6.57	6.95	8.73
SanFran.(w'hse)	6.44	7.88[3]	9.25[3]	6.45	...	6.41	8.20	11.30	6.25	6.38	8.45

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

(1951 contract prices; 1952 prices not established)

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)—	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Feb. 12, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $85; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $94.60; Salina, O., $99.60; Niles, O., $104; Los Angeles, Pittsburg, Calif., $126.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $94.60; Hays, Pa., $100.10; Niles, O., $102; E. Chicago, Ind., Joliet, Rockdale, Ill., $104.50; Cutler, Utah, $111; Los Angeles, $117.

Insulating Fire Brick

2300° *F:* Massillon, O., $170; Clearfield, Pa., $171; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $178.

Ladle Brick

Dry Pressed: Bessemer, Ala., $61.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $66; Mexico, Mo., $70; Clearfield, Pa., Portsmouth, O., $79.20; Peria, Ark., $88; Los Angeles, $105; Pittsburg, Calif., $106.

Sleeves

Reesdale, Pa., $121; Johnstown, Pa., $121.30; Clearfield, Pa., $128.70; St. Louis, $131.45; Athens, Tex., $134.20.

Nozzles

Reesdale, Pa., $193.60; Johnstown, Pa., $198.55; Clearfield, Pa., $209; St. Louis, $213.95; Athens, Tex., $214.50.

Runners

Reesdale, Pa., $150.70; Johnstown, Pa., $154; Clearfield, Pa., $160; St. Louis, $162.25; Athens, Tex., $166.10.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $158.40; Danville, Ill., $161.40.
60 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $200.20; Danville, Ill., $203.20.
70 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $233.20; Danville, Ill., $236.20; Clearfield, Pa., $240.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: For current quotations on manganese, titanium and "other" ferroalloys, see page 159, May 26 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 173, May 19 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

May 29	$43.00
May 22	43.00
Apr. 1952	43.00
May, 1951	44.00
May, 1947	29.75

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin..

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	— 10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $5.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross tons which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

OPEN MARKET PRICES CAST SCRAP

Birmingham
(Delivered)

No. 1 cupola cast	$42.00-43.00
Stove plate	38.00-39.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	34.00
Heavy breakable	32.00
Stove plate	32.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 cupola cast	42.00-43.00

Chicago
(Delivered)

No. 1 cupola cast	43.00-47.00
Charging box cast	39.00-41.00
Heavy breakable	36.00-38.00
Burnt cast	36.00-38.00
Cast iron brake shoes	40.00-41.00
Stove plate	36.00-41.00
Clean auto cast	43.00-45.00
Unstripped motor blocks	33.00-35.00
Malleable	48.00-50.00
Drop broken machinery	45.00-50.00

Cleveland
(Delivered)

No. 1 cupola cast	44.00

Detroit
(Brokers' buying prices; f.o.b. shipping point)

No. 1 cupola cast	43.00-44.00
Heavy breakable	39.00
Clean auto cast	46.00-47.00
Unstripped motor blocks	36.00-37.00
Drop broken machinery	46.00-47.00
Stove plate	42.00-43.00
Charging box cast	43.00

New York
(Brokers' buying prices; delivered consumers' plants)

Cupola cast	40.00
Unstripped motor blocks	34.00

Philadelphia
(Delivered)

No. 1 cupola cast	39.00-40.00
Unstripped motor blocks	35.00
Heavy breakable	42.00

Pittsburgh
(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00
Charging box cast	47.00

San Francisco
(Delivered)

No. 1 cupola cast	41.00

St. Louis
(Delivered)

No. 1 cupola	41.00
Stove plate	39.00
Unstripped motor blocks	35.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new fractory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

For power economy in press operation: A double-pressure pump, automatically lubricated, with totally-enclosed mechanism.

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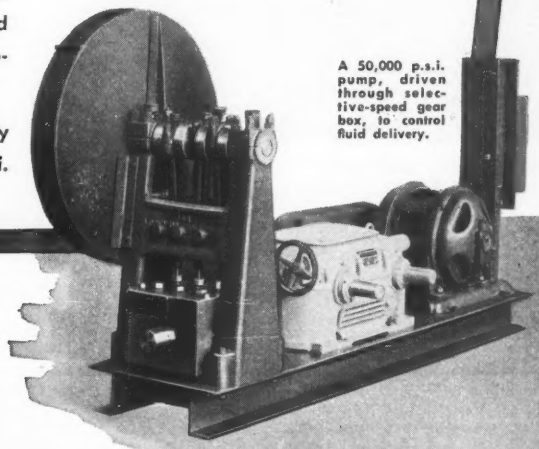

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The hard-faced blades on this 21 cu. ft. mixer have already lasted 20 times as long as cast steel blades, mixing 75 cu. yd. of concrete daily, 6 days a week.

HARD-FACING

Saves 19 Shutdowns

Cast steel concrete mixer blades, used in the production of concrete blocks, had to be replaced every 4 or 5 weeks when running 3 shifts a day, 6 days a week. Besides the high cost of the new blades, there was the added expense of installation and lost production time while the mixer was being repaired.

The life of the blades was increased to at least 20 months, by coating their surface with a ⅛-in. deposit of HAYSTELLITE tungsten carbide tube rod by the metallic-arc process. The long service life of the hard-faced blades helps to maintain continuous production without frequent and costly shutdowns for the replacement of worn blades.

For complete information on hard-facing, including descriptions of the various HAYNES alloy rods and the method of selecting the right rod to combat your wear problem, write for the 40-page booklet, "HAYNES Alloys—Hard-Facing Manual."

HAYNES TRADE-MARK *alloys*

"Haynes" and "Haystellite" are trade-marks of Union Carbide and Carbon Corporation.

Haynes Stellite Company
A Division of
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Chicago — Cleveland — Detroit — Houston
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The Metal Market

Industry marks time in buying foreign copper while government attempts to untangle the snarl created by settlement with Chile. ODM passes the buck to consumer via NPA, OPS

MIDNIGHT OIL burned in Washington last week as NPA and OPS sought means of handling the hot potato tossed at them with the Chilean copper agreement.

The agencies had no advance notice of the move by Acting Defense Mobilizer John Steelman, and have been hard put explaining the order to copper-hungry consumers. Meetings last week were held with copper producers and prime users to try to untangle the snarl.

Paradox—First NPA has to figure out means of coping with this strange combination of a free and a controlled market, whereby consumers are allowed to pay world market prices for copper but are subject to both use and price controls. The government in attempting to save face in its concessions to Chile, is in effect passing the blame for higher prices to consumers via NPA and OPS. That the agencies believe this chore distasteful is witnessed by the mutterings about resignation by industry men within NPA.

Industry, meanwhile, could do little but wait for interpretation on how much foreign copper it was allowed to buy and use. Pricewise, brass mills, copper wire mills and other primary users of refined foreign copper can pass along to customers four-fifths of the added cost of imported copper above 27½ cents.

Bridging the Gap—The settlement did spur immediate release of 22,000 tons of copper from the government's strategic stockpile. It will be used to tide industry over until Chilean copper arrives. By tapping the stockpile, NPA can maintain total refined copper and copper scrap allocations in June at about the May level.

NPA also predicts a "shortfall" in copper controlled materials allotments for brass mills and foundries in the third quarter of 10 to 20 per cent. Reason for the lessened impact is that program levels were set high when made by DPA in April.

Irresponsible — Industry criticism was directed at long-term planning and predictions last week, too. Speaking before the National Association of Purchasing Agents in Atlantic City, Whipple Jacobs, president, Phelps Dodge Copper Products Corp. said: "The statement that copper will be in short supply for a ten-year period is completely unrealistic if not irresponsible."

HEADACHES FOR COPPER USERS
. . . price decontrol a possibility

Mr. Jacobs predicted that copper output by 1955 will increase 35 per cent over 1951 production and supply will increase 35 per cent over 1951 production—and that supply will balance demand long before the increased production schedules are completed. The price of copper, Mr. Jacobs believes, will decrease in the post war, post emergency, post planning period, settling in the 19 to 24 cent area.

The Buildup — Here's how Mr. Jacobs estimates copper production increases: In 1952 to 1,530,000 short tons or 11.6 per cent over 1951. In 1953 to 1,660,000 short tons or 21 per cent over 1951. In 1954 to 1,690,000 short tons or 23.3 per cent over 1951. In 1955 to 1,855,000 short tons or 35 per cent over 1951.

Copper price future was likened to present happenings in lead and zinc by Mr. Jacobs. "I do not recall at any time when the principal nonferrous metals moved divergently pricewise—not that they all moved simultaneously or in the same amount, but I do not recall when two moved down while one moved up. To me it is only a matter of time—and the day is delayed by price and allocation controls—when copper supply will balance demand, and that time in my opinion will come before the expected increased supplies are available."

DMPA Balance Sheet Unveiled

Progress report on Defense Materials Procurement Agency's program to speed production of metals and minerals shows Jess Larson's agency received 1622 applications for assistance by May 1. Of these, 605 were denied, 455 withdrawn, and 369 put into effect. The rest were still in process. On contracts approved so far, here's DMPA's breakdown of what its operations will achieve. (Approximate pre-Korea consumption in parentheses):

Copper—An additional 400,000 short tons between 1951-1956, with a maximum annual expansion by 1956 of 165,200 tons. (2,000,000 short tons).

Nickel—An additional 112,750 short tons during the 1951-1956 period, with maximum annual expansion in production by 1956 of 28,900 tons. Potential production now under review would add 45,800 tons by 1956. (101,000 short tons).

Chrome—900,000 short tons of chrome ore for the period 1952-1956. (950,000 short tons).

Cobalt—An additional 22.3 million pounds during the 1951-1956 period, with a maximum annual assisted production of 5,126,000 pounds by 1954. (10,000,000 pounds).

Lead—Maximum annual expansion by 1955 estimated at 50,000 short tons with a total cumulative increase for 1951-1956 of 194,600 tons. (1,250,000 short tons).

Fluorspar — Expanded production of 240,000 short tons of acid grade over the 1952-1956 period, with maximum annual production estimated at 60,000 short tons in 1955. (155,000 short tons).

Manganese Ore — 1,070,000 long tons over the 1951-1956 period, with a maximum annual expanded production of 247,000 tons by 1953. (1,850,000 long tons).

Titanium—19,150 additional short tons between 1951-1956 with a maximum annual production of 4510 short tons by 1954. (140 short tons).

Zinc—856,600 short tons over the 1951-1956 period with a maximum annual expansion of 214,500 tons by 1954. (1,100,000 short tons).

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 14.80c; chemical nom.; corroding 14.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $198-$201 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.25 del.; special or patented shapes $2.46.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 82.75c per oz.

Platinum: $102-$105 per ounce from refineries.

Palladium: $25 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.39; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4 17S-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $20.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $20.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50c-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb. 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 13.00-13.25; battery plates 8.50-8.75; linotype and stereotype 15.50-16.00; electrotype 14.00-14.50; mixed babbitt 15.50-15.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 28	24.50	14.80	19.50	121.50	19.00	39.00	56.50	82.75
May 20-27	24.50	14.80	19.50	121.50	19.00	39.00	56.50	84.00
May 16-19	24.50	14.80	19.50	121.50	19.00	44.00	56.50	84.00
May 15	24.50	14.80	19.50	121.50	19.00	44.00	56.50	85.00
May 13-14	24.50	14.80	19.50	121.50	19.00	44.00	56.50	86.00
May 12	24.50	14.80	19.50	121.50	19.00	44.00	56.50	87.00
May 6-10	24.50	16.80	19.50	121.50	19.00	44.00	56.50	87.00
May 2-5	24.50	16.80	19.50	121.50	19.00	44.00	56.50	88.00
May 1	24.50	17.80	19.50	121.50	19.00	44.00	56.50	88.00
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 169 & 170

Chicago — Cold-rolled sheets continue their extreme tightness in this area. Mills are running far behind in shipments. Some had already drastically reduced second and third quarter quotas and all will be obliged to cut in fourth quarter to bring schedules into something approaching balance. Situation has developed from a combination of overbooking and production less than anticipated. Part but not all of the latter comes from strike loss. Fourth quarter quotas will be issued shortly. There is a feeling that demand isn't as solid as order books indicate. Uncertainties over production and prices prompt consumers to take all the material they can get. Galvanized product is exceedingly tight.

Boston—Availability of flat-rolled depends on the product needed. Straight chromium stainless, narrow carbon strip and silicon sheets and strip can be bought within normal lead-time. Deliveries on other products vary, but extend through third quarter with nickel-bearing stainless hardest to obtain, followed by galvanized. There is some hardening in cold-rolled sheets, but most stampers could stand more business.

New York—While some producers can still accept tonnage for third quarter, sheet mill capacity generally is well booked up for that period on hot and cold-rolled sheets and galvanized sheets. Certain larger mills haven't any open capacity left.

Philadelphia—Although the market is softer on the light flat products than on the heavier items, eastern sheet mills are well booked ahead on hot and cold sheets and galvanized. An exception is one premium mill turning out sheets in a limited range.

Pittsburgh — Cold-rolled sheet demand is excellent at district mills thanks to automotive demand. Hot-rolled also is in good condition being in tighter supply than cold-rolled. No change is noted in the galvanized sheet situation and many consumers are back in their inventories. A strike of a month's duration would firm up the entire situation until year's end or later. Currently, strip is considered firm by the mills but weakners could appear at any time.

Washington—Supplementary quota of 45,352 short tons of various types of carbon steel rejects has been made available for regular commerical exports in second quarter. The additional quota covers hot and cold-rolled sheet rejects and tin mill black plate waste-wasters, 42,400 tons; wire rejects, 620 tons; wire rod rejects, 1475 tons; and used and reject pipe, 857 tons. These reject materials are in more ample supply in the domestic market than the primary steel mill products.

Cleveland — With sheetmakers booked through third quarter few openings in schedules are anticipated in the period and with demand definitely improved from some consuming directions tighter supply conditions than have prevailed in this market for some months past are indicated. Conditions will be even more acute should another steel strike halt mill operations.

YOUNG MEN
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Their future is based on decisions made today. The secret of success at Indiana Gear is to visualize . . . create . . . prove . . . and then move on to conquer the next problem. Indiana Gear proves from past success in a highly competitive business that its policy of using master craftsmen, fine equipment, skilled subcontractors, and "young men of vision," exemplifies the perfectly coordinated planning so necessary to solve the gear problems of today.

INDIANA GEAR

The driven gear shown here is 5" in pitch diameter and 15" long overall. It is carburized and hardened with heat-treating distortion held within .001".

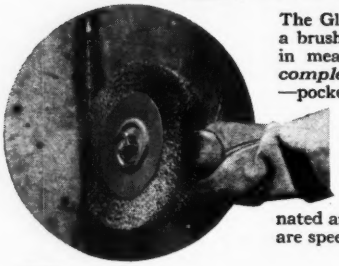
INDIANA GEAR WORKS • INDIANAPOLIS 7, INDIANA

How Pittsburgh Brushes IMPROVE QUALITY!

1. Finishing stainless steel sheets!

Brushes formerly used by the Eastern Stainless Steel Corp. to produce a dull satin finish on stainless steel sheets were unsatisfactory. Ridging and uneven finish had to be eliminated from these sheets, used to press laminated plastics. Pittsburgh engineers recommended a Spiral Wound Tampico rotary brush—now uniform finishes are no problem!

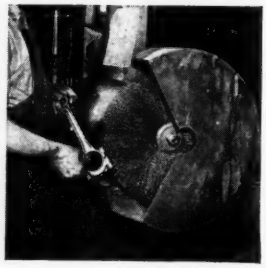
2. Cleaning welds!



The Globe Company required a brush that would get welds in meat handling equipment *completely clean* and smooth—pockets left in welds might trap food particles. Pittsburgh suggested a coarse wire, extra heavy fill rotary brush. Now pockets are completely eliminated and finishing operations are speeded up.

3. Reconditioning automotive connecting rods!

How to rid reconditioned engine rods of grease, gum, etc., without harming precision surfaces? When Federal Mogul Service presented this problem to Pittsburgh engineers, Pittsburgh recommended a number of standard brushes, mounted on two- and four-horsepower motors. One man now cleans up to 500 pieces a day, *without damage* . . . problem solved!



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PITTSBURGH

Power Driven

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COLD HEADING EQUIPMENT
Up to ⅝ inch

AUTOMATIC SCREW MACHINES
B & S #00-Conomatic 3½"

EYELET STAMPING
Up to 3" drawn shell

All signs point to . . .

DIAL SCREW & SCREW MACHINE PRODUCTS

AN3—AN20	Aircraft Bolts
AN21—AN36	Clevis Bolts
AN42—AN49	Eye Bolts
AN73—AN81	Engine Bolts
AN139—AN170	Turnbuckles
AN173—AN186	Close Tolerance Bolts
AN255	Round Head Necked Screw
AN276	Ball & Socket Joint
AN386	Threaded Taper Pin
AN392—AN402	Flat Head Pin
AN490	Rod End
AN500—526	Complete Line Machine Screws—Alloy and Commercial Steels—Philips and regular head
AN555	Shoulder Bolt
AN565	Set Screws
AN774—AN775	Universal Bolt
AN780	Union
AN785—AN786	Coupling
AN800	Cone
AN801	Connection
AN805	Nut
AN806	Plug
AN807	Adaptor
AN814	Plug
AN815	Union
AN816	Nipple
AN817—AN818	Nut
AN819	Sleeve
AN820	Cap
AN832	Union
AN840—AN841	Adaptor
AN867, AN870, AN871, AN872, AN873	Flanges
AN876	Collar
AN893—AN894	Bushing
AN909	Plug
AN910	Coupling
AN911	Nipple
AN912	Bushing
AN913	Plug
AN919	Reducer
AN920	Union
AN924	Nut
AN929	Cap
AN933	Plug
NASB	6 DIGITS
Bolts, Nuts, Screws & Rivets	AN101001—AN126274

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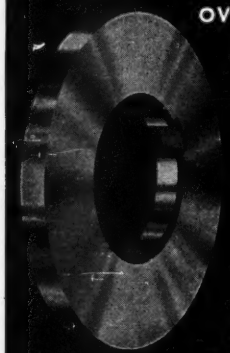

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Plates . . .

Plate Prices, Page 169

Chicago—Lighter plates are not as tight as recently but demand for the heavier gages is as persistent as ever. Production is suffering somewhat by fact rolling of conversion steel is almost at an end and there is little prospect it will be resumed under present conditions. An influence promoting tightness is the growing requirements for plate of about ⅜ inch thickness for extrusion into cartridge cases.

Pittsburgh—Wide, heavy gage material is in tight supply here, but narrower, lighter gage stock is freer due to continuous hot-strip mill tonnage which can be secured with much less trouble by consumers.

Boston—Sheared quality and low alloy plates, notably in wider, heavier sizes are sold out through third quarter with non-premium mills. Several producers charging smaller premiums are in the same position, although in September schedules some are still holding some open space. Smaller plate shops, largely users of lighter material, have cut into backlogs and are not pressing for tonnage, notably in narrow widths. An exception is structural fabricating shops. The Navy is buying hull plates in better volume, Lukens Steel Co., Coatesville, Pa., booking 1240 tons. Shipyards will require more tonnage in second half.

New York — Demand for heavy gage plates is sustained at high level. Producers, not quoting on a month-to-month basis, are booked up solidly for third quarter. Those booking on a monthly basis are sold out through August. Light gage plates are moving well, although not under the pressure noted for the heavy thicknesses, especially one-half inch and over. The larger non-premium mills actually are booked up throughout third quarter on lighter material, as well as on heavy. Strapping of cargo vessels and tankers, which have been moth-balled, is contributing to increasing demand for some lighter gages.

Philadelphia — Non-premium sheared plate mills are booked to the hilt for third quarter. Certain premium mills booking on a monthly basis are also booked solidly for as far ahead as they have opened their books. In at least two instances this means through August.

Seattle—Plates are in tight supply and small fabricators are committing themselves only within the limits of available steel supply. Additional tonnages for dam penstocks and pipe for power projects are pending.

Wire . . .

Wire Prices, Page 171

New York — Third quarter wire mill schedules are filling slowly on all products. Some high carbon items can be processed for June. Forward buying is conservative and consumers are not stampeding to place allotments. Until recently rope wire demand held at somewhat better than average, but it has begun to slip, while oil tempered spring wire is slow. Wire tonnage required on a continuous monthly basis for military contracts is a minor factor. Two contracts for nearly 8.5 million feet of wire rope, Navy, were divided between John A. Roebling's Sons Co., Trenton, N. J., and Hackensack Cable Corp., Hackensack, N.J.

Tin Plate . . .

Tin Plate Prices, Page 170

Washington—Third quarter applications for licenses to export secondary tin plate products must be filed June 2 to 30 with the Office of International Trade. This filing period applies to applications covering unassorted and mixed tempers, unmended menders, mill accumulations, waste-waste, strips, circles, cobbles, misprints, etc.

Filing of fourth quarter applications for licenses to export production tin plate is set for June 16 to July 18.

Los Angeles—The Kaiser tin mill, of 200,000 tons annual capacity, will be in operation by summer.

Tubular Goods . . .

Tubular Goods Prices, Page 173

Boston—Seamless pipe and pressure tubing specialties are the most extended. Light wall tubing is easily obtained and buttweld pipe is at least balanced with demand. Direct shipments are maintained with utilities seeking larger volume in some cases.

Los Angeles—Brokers are offering European-made tubing to oil companies at $290 per ton laid down, all charges paid.

Steel Bars . . .

Bar Prices, Page 169

Cleveland — Bar producers anticipate no easing in demands on them for months to come. Military requirements will continue to limit tonnage available for civilian needs indefinitely. In fact, with a military set-aside program scheduled to go into effect Aug. 1, requiring producers to reserve specified tonnages of 1½-in. and large bars strictly for military production, further pinch of civilian supplies is seen.

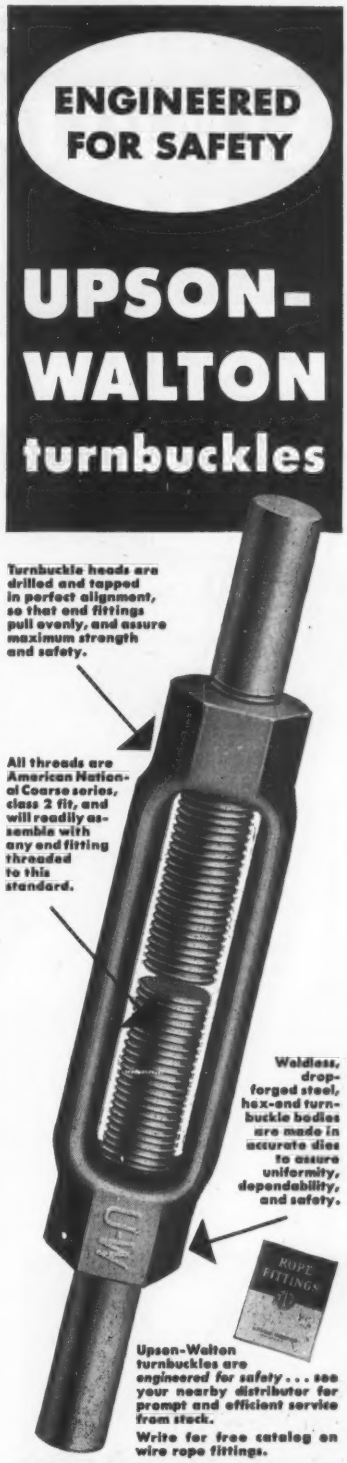
Boston—Set-asides of specific bar tonnages, 1½-in. and larger for military production will reduce the volume of civilian openings in third quarter. This move is aimed at reducing the number of late directives. Slight easing is developing in smaller sizes of carbon bars, but converters' inventories of hot-rolled are lower.

New York—Hot carbon bar consumers know about where they stand as to tickets for third quarter.

Most producers will not open books on hot carbon material for fourth quarter until well into June. However, sellers of alloy bars are taking orders for last quarter and also most sellers of cold drawn carbon bars.

Pittsburgh—District producers, completely sold out for third quarter, are unable to offer any help for the many uncashed CMP tickets seeking rolling time. They see no appreciable relief until well into fourth quarter—if then.

Philadelphia—Although some easing is reported in the West, which may in time be reflected here, hot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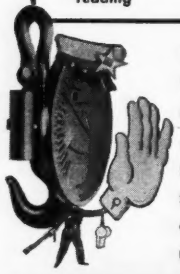

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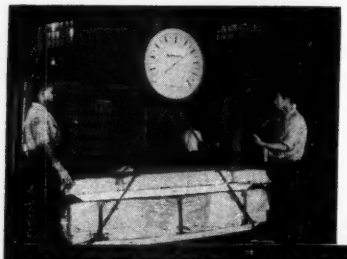

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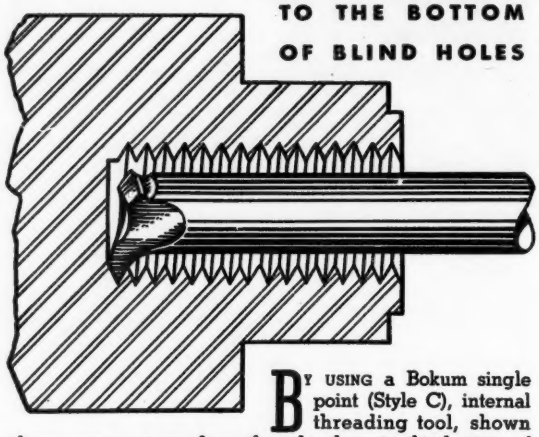

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carbon bar consumers report continued inability to obtain all the tonnage they desire. The larger diameters remain particularly scarce and there is not a single mill which normally feeds this area that has any capacity left for third quarter.

Chicago—Consumers of small sizes of hot-rolled and cold-finished carbon bars are experiencing little difficulty in getting accommodated. From ½-inch upward, however, the situation is extremely tight and growing worse.

Structural Shapes . . .

Structural Shape Prices, Page 169

New York—April bookings of fabricated structural steel amounted to 205,022 tons, decrease of 9 per cent from the previous month, according to the American Institute of Steel Construction. Total bookings for the first four months amounted to 875,358 tons, this allowing for a revision in the March total to 226,394 tons. April shipments amounted to 230,874 tons, compared with a revised total of 268,840 tons in March. Backlogs as of Apr. 30 amounted to 2,350,974 tons.

New York — Notwithstanding the easing in building restrictions in this area awards are still scattered. However, indications point to substantially increased commercial work in second half, with the bare possibility overall tonnage in this particular area might even be greater than in the half now closing.

Boston — Active and potential bridge volume is substantial with competition keen among district shops estimating smaller-tonnage, public work, schools predominating. Contracts are featured by lettings for the Fitzgerald Expressway, Boston, 25,000 tons.

Pittsburgh—Demand for shapes is termed spotty, but mills will enter fourth quarter with about 42 days' backlog and look for near-capacity operations until year's end.

Chicago — Backwardness with which new building construction and freight car orders are coming out forecasts an easing situation in structurals the latter part of the year.

Seattle—Fabricators are operating steadily, but some shops are running short of forward business and are seeking third quarter orders.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 169

Boston—Increased number of relatively small orders for reinforcing bars, 100 to 350 tons each, totals approximately 1500 tons for schools, warehouses and bridges. For highways and bridges, inquiries will continue strong through third quarter. Most projects designed for reinforced concrete construction earlier to conserve structural steel will go ahead, including scattered hospital construction. Quotations on fabricated bars in place tend to firm slightly, although the low bid generally is close to 10.00c per pound by successful contractors.

Seattle—Rolling mills, with three months' backlog, are operating at capacity. However, demand for reinforcing bars appears to be off slightly although numerous small jobs are coming out. Several large tonnages pend.

Pig Iron . . .

Pig Iron Prices, Page 168

New York—Despite the threat of another steel strike, district pig iron consumers are exerting little pressure for tonnage. Foundry operations are around 50-60 per cent. with the vacation season approaching foundry production will sink lower before turning upward. Further easing of controls on pig iron, suggested by the NPA Industry Advisory Committee, are not likely until after a decision is handed down by the Supreme Court in the steel seizure case, for the reason if the decision does go against the government there might be a general strike in the steel industry.

Boston—Consumers have filled inventory gaps growing out of the recent suspension of the district furnace, the latter now in blast on malleable.

Philadelphia—Influence of the approaching vacation season is seen in pig iron. Various foundries have advised sellers of their plans to close down during the early part of July, in most cases for two weeks. In the light of this prospect they are asking sellers to suspend shipments beginning the last week of June.

Pittsburgh—Market for merchant pig iron continues tight due to strikes which have cut off some available supplies. Strike at merchant furnaces in Ohio has caused many inquiries to be diverted. If another steelworkers' strike materializes the situation will become serious, industry authorities advise.

Cleveland — Demand pressure on merchant iron sellers here is slightly stronger as result of the continued shutdown of the Toledo, O., furnaces. Strike at these furnaces now is in its sixth week. Melters dependent on these stacks for supplies are turning elsewhere for tonnage. Generally, iron supplies are adequate for all needs with the foundry melt still curtailed.

Chicago—Of the district's 42 blast furnaces four are out of production and this is producing a tightening effect on merchant pig iron supply.

Buffalo—With approximately 75 to 80 per cent of current pig iron output here going into steel production, producers have not appreciably felt the tapering in demand for merchant iron. Many small foundries in the area, however, are looking for work. Substantial iron tonnages still are being shipped up the lakes from this section. The only idle stack here is expected to be relighted shortly.

Iron Ore . . .

Iron Ore Prices, Page 175

Cleveland—Lake ore shipments in the latest week of record totaled 3,081,368 gross tons, boosting the season's movement to date to 16,497,539 tons, according to the Lake Superior Iron Ore Association. In the like week last year ore shipments were 2,894,470 tons, the season movement totaling 16,372,189 tons.

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Scrap . . .

Scrap Prices, Page 176

Pittsburgh—Mills are buying but due to better stocks and increased tonnages available from dealers, they are getting more selective. All consumers have built up their stockpiles to the point where it is rare to find a producer that does not have at least 5 to 7 weeks' supply on hand. While ceiling prices are being charged on all grades except cast, mills consider they are getting price concessions because of the better quality material received at the same prices paid for lesser quality a few months back. Turnings are finding few buyers here, and what cast that is moving both within and out of the district is selling far below established ceilings. Some reports peg it as low as $8.50 per ton.

Detroit—Cast scrap continues to go begging, brokers prices being off by about $2 on the average and only niggardly interest shown in their offerings. Only scrap in fair demand at ceiling prices are open hearth and electric furnace grades, a moderate volume moving steadily, mostly against old orders. Blast furnace grades are weak. Last week's sales of turnings by generators in Detroit and in Flint are regarded as setting the stage for consumer buying at considerably off the ceiling. It is suggested that mill buying at $5 below ceiling on turnings and borings may be possible.

Dealer sales of machine shop turnings have been made to brokers at $25, or $5 off ceiling, but this price is sagging with $24 now sought on this grade. Normally short shovel turnings and other blast furnace grades are off $5 on appraisal, but there is no activity at the lower figure. One important auto company says it expects to get ceiling prices for its turnings but dealer material is likely to go for less if buyers can be found. Several large mills outside this district are holding up scrap receipts starting today.

Buffalo—Buying interest in cast scrap is virtually nil. Offerings are neglected at prices ranging from $8 to $9 per ton below ceiling. Steelmaking grades, however, are holding. A barge consignment of approximately 2400 tons arrived from the seaboard. Water receipts this year are at low ebb.

Boston—Cast scrap buying is stagnant and steelmaking grades are slower with demand centered mostly in higher grades. On limited volume cast is selling well below ceiling while some easing in steel is expected by some consumers, appearing first in blast furnace scrap.

New York—Scrap demand is sluggish, this applying not only to cast grades, which have been moving slowly for weeks, but to most steel grades as well. Only for the very top grades of open-hearth scrap does there appear to be any pressure. Some mills are even holding up on shipments.

Philadelphia—Further easing is developing in prices on No. 1 cupola cast, the market now holding at $39 to $40 delivered. No other price changes are noted at the moment although the general undertone is easy. Most prime grades of open-hearth scrap are in good demand.

Chicago—Prices are $2 below OPS ceilings on machine shop turnings and blast furnace grades of scrap. Some consumers are restricting amounts of No. 1 and No. 2 bundles they will take in relation to heavier grades. Cast grades remain sluggish with prices lower.

Warehouse . . .

Warehouse Prices, Page 175

Cleveland—Receipts from the mills have been adversely affected by the recent loss of tonnage resulting from the April steel strikes. Consequently, the imbalance in warehouse inventories continues and it will be some time before correction will be possible. Over-all stocks of the distributors are much improved as compared with six months ago but buyers have to shop around to fill all of their needs.

New York—Orders are smaller individually with consumers buying closer to requirements. Volume is substantial, and would be heavier if better stocks were available in hot and cold-rolled bars, notably large rounds and flats, angles, structurals and wide plates.

Philadelphia—District warehouses report a decline in business for May, this being the first month so far this

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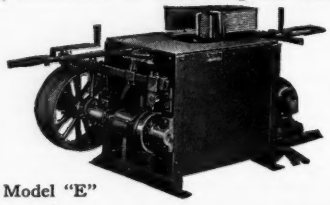
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year that the trend was off on a daily basis. Some distributors look for even further decline in June.

Pittsburgh — Demand currently is described as good. Only fly in the ointment is the continuing imbalance of warehouse stocks. Mill shipments have been fair but currently are back about five weeks due to the recent steelworkers' walkouts.

Los Angeles—Warehouse steel purchases are steady. More steel is being received than sold. Distributors' stocks, improved and in better balance, are in some cases 60 to 80 per cent of normal.

Seattle — Warehouses expect by July 16 to have rate schedules revised to include the additional freight increases from eastern centers. Recent increases average $2 to $3 per ton. Present and increased rail rates from important producing areas to the Pacific Northwest are: Geneva, 76c and 83c; Gary, $1.62 and $1.75; Cleveland, $1.82 and $1.97.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4300 tons superstructure, Fitzgerald expressway, Boston, contract D-2, to Mt. Vernon Bridge Co., Mt. Vernon, O.

4200 tons, superstructure, Fitzgerald expressway, Boston, contract C-2B, to Bethlehem Steel Co.

3800 tons, superstructure Fitzgerald expressway, Boston, contract C-2C, to Bethlehem Steel Co.

3700 tons, superstructure, Fitzgerald expressway, Boston, contract H-2B, to Harris Structural Steel Co., New York.

3650 tons, superstructure, Fitzgerald expressway, Boston, contract H-2A, to Bethlehem Steel Co.

2820 tons, office building on old Hippodrome site, Avenue of the Americas, New York, through Hegeman Harris, to Bethlehem Steel Co.

1430 tons, plant building, Eaton Mfg. Co., Marion, O., through Wigton-Abbott Corp., general contractor, to Fort Pitt Bridge Works, Pittsburgh.

800 tons, pulp mill, Rayonier Inc., Doctortown, Ga., to Bristol Steel & Iron Works, Inc., Bristol, Va.

700 tons, boiler supports, Foster Wheeler & Co., Martin Creek, Pa., to Bethlehem Steel Co.

540 tons, factory addition, Kaman Aircraft Corp., Bloomfield, Conn., to City Iron Works, New Haven, Conn.

500 tons, plant, Kiekhofer Container Co., Union Gap, Wash., to Pacific Car & Foundry Co., Seattle.

350 tons, medium angles, Navy Purchasing Office, Washington, to Southern Galvanizing Co., Baltimore.

335 tons, cold storage bakery building, Willard, N. Y., through Brown-Turner Inc., general contractor, to Anthracite Bridge Co., Scranton, Pa.

335 tons, warehouse and office building, Tube Distributing Co. Inc., Garden City, Long Island, through Cauldwell-Wingate, general contractor, to Simon Holland & Son Inc., Brooklyn, N. Y.

270 tons, building, American Museum of Natural History, New York, to Simon Holland & Son Inc., Brooklyn, N. Y.

225 tons, section, Major Deegan highway, Bronx county, New York, to Phoenix Bridge Co., Phoenixville, Pa.

220 tons, North Junior High school, Pittsfield, Mass., to Schenectady Steel Co., Schenectady, N. Y.; Verge-Whipple & Co., Pittsfield, general contractor.

200 tons, boiler supports, Combustion Engineering-Superheater Inc., High Grave, Calif., to Bethlehem Steel Co.

190 tons, regional school building, Holden, Mass., to United Structural Steel Co., Worcester; J. W. Bishop Co., Worcester, general contractor.

125 tons, transmission crossing towers, for Tacoma light department, to Bethlehem Pacific Coast Steel Corp., Seattle, low $41,400.

100 tons, New York Central bridge, St. Johnville, N. Y., to Fort Pitt Bridge Works, Pittsburgh.

85 tons, high school, South Kingston, R. I., to Tower Iron Works, Providence, R. I.

STRUCTURAL STEEL PENDING

3950 tons, bridge superstructure, Fitzgerald expressway, Boston, connection part 1, contract C-2A; readvertised June 10, state Department of Public Works, Boston.

550 tons, bridge superstructure, Eldersburg-Louisville road, Baltimore; bids June 4, Department of Public Works, Baltimore.

250 tons, structural steel supports and metal piping, North Metropolitan relief tunnel, Chelsea, Mass.; S. A. Healy Co., White Plains, N. Y., low, general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

580 tons, highway and box culverts, Middletown, Conn., to Truscon Steel Co., Long Island City, N. Y.; D. Arrigoni Co., Middletown, general contractor.

525 tons, Navy Purchasing Office, Washington, to Sheffield Steel Corp., Kansas City, Mo.

320 tons, bars and rods, regional school, Holden, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; J. W. Bishop Co., Worcester, general contractor.

300 tons, North Junior High school, Pittsfield, Mass., to A. D. Donald Steel Co., Springfield, Mass.; Verge-Whipple & Co., Pittsfield, general contractor.

185 tons, two-span reinforced concrete bridge, Hopkinton, R. I., to Plantations Steel Co., Providence, R. I.; General Engineering & Contracting Co., Providence, general contractor.

125 tons, high school, South Kingston, R. I., to United States Steel Supply Co., Cambridge, Mass., through Maloney & Rubien Co., Providence, R. I., contractor.

100 tons, single span concrete bridge, Richmond, R. I., to Plantations Steel Co., Providence, R. I.; General Engineering & Contracting Co., Providence, general contractor.

100 tons, building at air base, Great Falls, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle; Phil McInnes and Henry George & Sons, Spokane, general contractors.

100 tons, incinerator, Hartford, Conn., to Scherer Steel Co. through Associated Construction Co., contractor, both of Hartford; also 230 tons of fabricated structural steel, to Berlin Iron Works, Berlin, Conn.

100 tons or more, classroom and auditorium, Teachers College, Danbury, Conn., to Ceco Steel Products Corp., New York, through Frouge Construction Co. Inc., Bridgeport, Conn.; fabricated steel to Stamford Iron Supply Inc., Stamford, Conn.

REINFORCING BARS PENDING

265 tons, deformed bars, mesh and tie bars, highway and box culvert, Newton-Southbury, Conn.; bids in May 26, Hartford, Conn.

220 tons, highway and bridges, Newbury-Newburyport, Mass.; bids June 3, Boston.

220 tons, highway and bridges, Newbury-Newburyport, Mass.; bids June 3, Boston.

PLATES . . .

PLATES PLACED

660 tons, three cone roof tanks, Shell Oil Co., Houston, to Wyatt Metal & Boiler Works, that city.

460 tons, storage tanks, various locations, Socony Vacuum Oil Co., to Bethlehem Steel Co.

400 tons, also structurals, four 165-foot gasolinge cargo barges for Air Force, to Albina Engine & Machine Works, Portland, Oreg., $560,000 contract.

395 tons, Socony Vacuum Oil Co., near Newburgh, N. Y., to General American Transportation Corp., Chicago.

340 tons, tank, Socony Vacuum Oil Co., near Poughkeepsie, N. Y., to Hammond Iron Works, Warren, Pa.

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GENERAL SPECIFICATIONS

Capacity, nominal
100,000 lbs.

Light weight, approx.
44,000 lbs. (aver.)

Load Limit
125,000 lbs. (aver.)

Inside length
40 ft. 0 in.

Inside width
9 ft. 7 in.

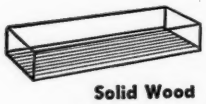
Inside height
4 ft. 2 in.

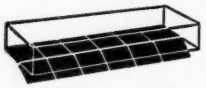
Cubic capacity
1552

Construction details available upon request.

Three Types of Bottoms Available

Solid Steel


Solid Wood


Side Dump to either side of car

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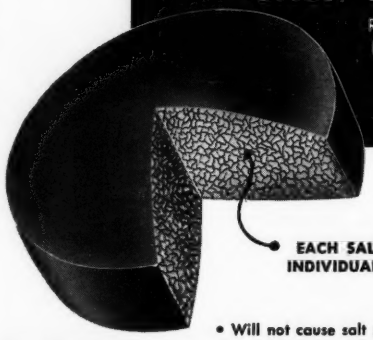

- Will not cause salt sickness or nausea
- No delay in getting salt into system
- Starts dissolving immediately
- Dissolves completely in about 100 minutes
- Withstands rough handling and storage without deterioration
- Meets Government Specification No. SS-S-31C
- Order Now—Be Prepared
- Write for literature and prices

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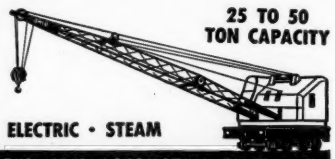

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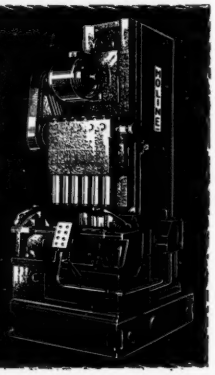

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Engineers To Honor Fairless

Benjamin F. Fairless, president, United States Steel Corp., was selected by the John Fritz board of award to receive the 1953 John Fritz medal and certificate as "Champion of the American Free Enterprise System for Notable Industrial Achievement in the Production of Steel." The medal is perpetuated by the four leading engineering professional societies: American Society of Civil Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Mechanical Engineers and American Institute of Electrical Engineers. Presentation of this award will be made at the centennial meeting of the American Society of Civil Engineers in Chicago in September.

$46 Million Plant Contract Awarded

Contract for a proposed $46 million pulp plant near Ketchikan, Alaska, was awarded jointly to Howard S. Wright & Co. and Guy F. Atkinson Co., Seattle, who are associated in the project under the name of Ward Cove Builders. Puget Sound Pulp & Timber Co., Bellingham, Wash., and American Viscose Corp., Philadelphia, are the principals in this venture.

Howard Foundry Buys Casting Business

Howard Foundry Co., Chicago, purchased the precision casting business of Allis-Chalmers Mfg. Co., Milwaukee. Howard will operate in leased Allis-Chalmers buildings until permanent headquarters can be found in the Milwaukee area.

Chevrolet Awards Building Contract

Chevrolet Motor Division, General Motors Corp., Detroit, awarded the general contract for completion of its million-square-foot manufacturing plant on Van Slyke Rd., Flint, Mich., to Darin & Armstrong Inc., Detroit. First manufacturing space in the new building is scheduled to be ready early in 1953.

Jackson Heads Chicago Purchasers

Purchasing Agents Association of Chicago elected as its officers: William D. Jackson, Container Corp. of America, president; Leonard M. Ansley, Inland Steel Container Co., first vice president; Robert L. Krueger, Goodman Mfg. Co., second vice president; L. R. Seen, Borg & Beck Division, Borg-Warner Corp., secretary; Harry M. Wise, Cenol Co. Inc., treasurer. Newly elected members of the board of governors for a 3-year period are: John J. Noel, Colligan-Zeolite Co.; Seymour Ellison, Perfection Gear Co.; Carl A. Peterman, Bliss & Laughlin Inc.

Standard Wire & Cable Moves

Standard Wire & Cable Co., Los Angeles, moved into its new office and sales building, 3440 Overland Ave., that city.

Republic Supply Liquidates Division

To increase working capital and furnish extra funds for expansion of the company's industrial supply business, Republic Supply Co. of California, Los Angeles, announces the firm's manufacturing division is in the process of liquidation. Principal product of this division is custom-made heavy machinery. The firm will concentrate on its principal business, the distribution of industrial supplies to the heavy industries of the West. Sales for the fiscal year of 1951 exceeded $21 million.

Askania Names West Coast Agent

Askania Regulator Co., Chicago, appointed Heat & Control Inc., San Francisco, as its West Coast representative. The complete Askania line of hydraulic automatic control equipment will be handled.

Lone Star Signs Ore Contract

Lone Star Steel Co., Dallas, signed a contract with Little River Mining Co., that city, for purchase of beneficiated iron ore. This supply will supplement that from Lone Star's own mines and beneficiating plant at its Daingerfield, Tex., Works. Production at the Little River plant, to be located at a point equidistant from Avinger, Hughes Springs and Jefferson, Tex., is slated to begin on or before Aug. 1, 1952. H. E. Shawyer is general superintendent and

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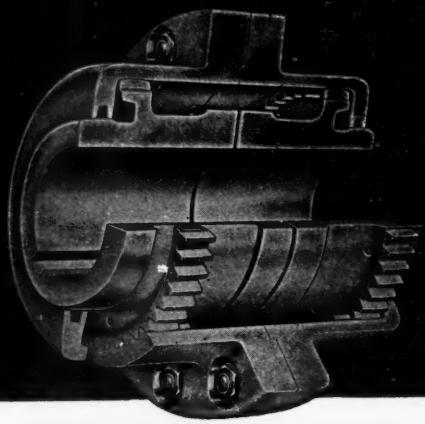

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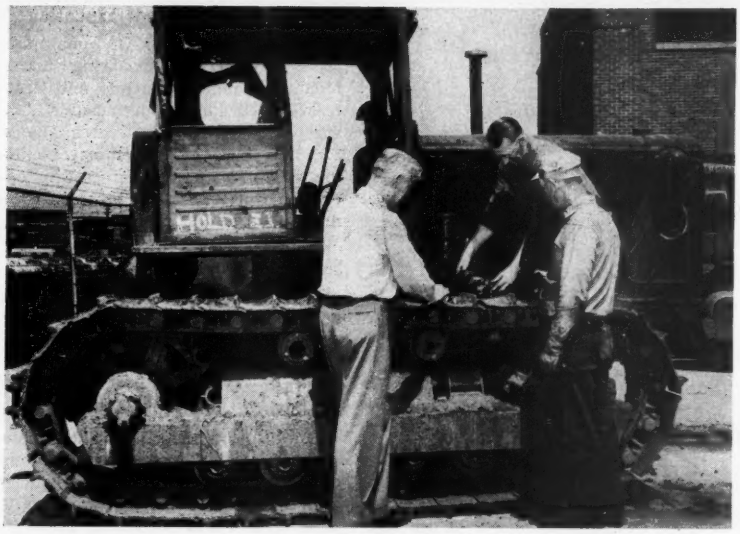

Communists Copy U.S. Tractor

This Russian tractor is a metric copy of the American-made Caterpillar D7. The tractor, captured in battered condition in Korea, was turned over to Caterpillar Tractor Co., Peoria, Ill., for examination. The company reported that "they are of much better quality than we had expected." The task of converting it to the metric measure was described as "no mean engineering feat"

will be in charge of all field operations.

Proto Tools To Build Ontario Plant

Proto Tools of Canada Ltd., branch of Plomb Tool Co., Los Angeles, plans erection of a plant in London, Ont., for manufacture of hand tools, etc.

Tungsten Carbide Firm Opens Branch

Vascoloy-Ramet Corp. established a regional warehouse and a sales and service organization in Birmingham. The company, a subsidiary of Fansteel Metallurgical Co., North Chicago, Ill., is a producer of tungsten carbide.

International Graphite Expands

Luria Engineering Corp., Bethlehem, Pa., completed delivery of an additional large steel building for the new manufacturing plant at Niagara Falls, N. Y., of International Graphite & Electrode Division, Speer Carbon Co., St. Marys, Pa. The new structure will be used in part for the extrusion of material for electrodes and in part for storage.

Container Maker Gets New Facilities

American Wood Products Corp., Marion, S. C., subsidiary of American Box Co., Cleveland, installed the latest type wood veneer-making and wirebound container equipment. Combined facilities of this organization constitute one of the nation's leading manufacturers of wirebound containers, "palletized" tote boxes, woodcleated and nailed-wood boxes.

Hooker Operating Tacoma Plant

Hooker Electrochemical Co., Niagara Falls, N. Y., started operating its $2 million anhydrous ammonia plant at Tacoma, Wash. Plans are under consideration to increase its capacity by 50 per cent.

Perfection Stove Names Agent

Perfection Stove Co., Cleveland, appointed Shield Co. Inc., Ft. Worth, Tex., as its distributor in that territory. W. W. Slaughter is president of the Shield organization.

Pratt & Whitney Moves Branch

Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., relocated its branch office at 845 Main St. W., Rochester, N. Y. C. G. Newton is district manager.

Brown-Wales Enlarges Warehouse

Brown-Wales Co., Cambridge, Mass., is building an addition to its steel warehouse. The addition is for fabrication of plates and for housing shearing and flame-cutting equipment to increase capacity 50 per cent.

Kidde Plans New Jersey Plant

Kidde Mfg. Co. Inc., machinery manufacturing subsidiary of Walter Kidde & Co. Inc., Belleville, N. J., purchased a 64-acre tract in Roseland, N. J., on which it expects to build a modern knitting machine plant.

Allis-Chalmers Builds Betatron

Construction is expected to be completed sometime in June on a building at the West Allis Works of Allis-Chalmers Mfg. Co., Milwaukee, to house a 22-million volt betatron for use in inspecting large steam turbine, centrifugal pump and hydraulic turbine parts produced by the firm. The betatron can be used for effective inspection of steel sections from 1 inch

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to about 24 inches thick. For thicknesses of less than 1 inch, the conventional 220,000-volt X-ray machine is more efficient.

Horton Gets $2.5 Million Order

Horton Steel Co. of Canada, Ft. Erie, Ont., was awarded a contract for steel work on the new penstocks at Queenston, Ont., for Ontario Hydro-Electric Power Commission at $2.5 million.

Scholl-Choffin Gets Piping Job

Scholl-Choffin Co., Youngstown, was awarded an order involving several million dollars for installing piping at United States Steel Co.'s Fairless Works at Morrisville, Pa.

Distributes Gear Grinding Wheels

Jerpbak-Bayless Co., Solon, O., appointed Crown Tool & Supply Co., Chagrin Falls, O., as distributor on a nationwide basis for its line of profiled gear grinding wheels for the Reishauer gear grinder.

Kaiser Aluminum Opens Branch Office

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., is opening a sales office in the Brown-Marx building, Birmingham. Lloyd Sheep, formerly service engineer with the Atlanta district office, will be in charge.

Emergency Steel Service Expanding

Irwin D. Harris, vice president, Emergency Steel Service Corp., Skokie, Ill., announces a new plant expansion program. Construction is under way on an addition to the company's warehouse at 7415 St. Louis Ave., that city. The company also purchased a building site in the vicinity on which to build a larger warehouse in the future.

Bendix Buys Photo-Electric Pilot

Bendix Aviation Corp., Pacific Division, North Hollywood, Calif., purchased Photo-Electric Pilot Corp., Seattle. Manufacture of the pilots will be moved to the North Hollywood plant. A. B. Dickson, president of Photo-Electric, will join the Bendix firm.

Pacific Tube Enlarging Facilities

Pacific Tube Co., Los Angeles, is constructing additional facilities at its present plant at 5710 Smithway St. at a cost of about $1,250,000. The new buildings will add 45,000 sq ft to the present roofed area of 121,000 sq ft and will provide increased production area plus enlarged laboratory, engineering, machine shop and mill office facilities. New production equipment will be installed. The new facilities will increase Pacific Tube's stainless steel tubing productive capacity by about 50 per cent with a corresponding increase in output of alloy and carbon tubing and cold-finished bars.

Metallizing: Economizing

When this 6¼-inch solid Monel tugboat shaft became worn at the stern packing, metallizing saved the owner thousands of dollars in replacement costs and rental losses. The part was turned down in the lathe to 6⅛-inch diameter, then sprayed with stainless steel to a thickness of 6⅝ inches. Next it was machined down to the required dimension of 6¼ inches. The boat was back in service in two days

Allis-Chalmers Names Distributor

Kahn Electric Motor Service, St. Louis, was named a distributor for Allis-Chalmers Mfg. Co.'s motors and controls in that district.

Michigan Oven Moves Offices

Michigan Oven Co. moved its offices to larger quarters in the Architects building, 415 Brainard St., Detroit.

GM To Build Parts Depot in Winnipeg

General Motors of Canada Ltd. will erect a $1 million parts depot in Winnipeg, Man., as soon as steel restrictions are eased. The company has a 100-acre plot of land for the proposed building.

Vapor Engineering Expands Plant

Vapor Engineering Corp. is constructing additional facilities at 5616 Leeds St., South Gate, Calif., for manufacture of industrial washing machines, tanks and process equipment.

Leeds & Northrup Plans Expansion

Leeds & Northrup Co., manufacturer of electrical measuring instruments, automatic controls and heat-treating furnaces, purchased a 125-acre tract of land at North Wales, Pa. The company contemplates moving to the new location certain operational or laboratory units from its main plant in Philadelphia.

Electronics Firm Moves Plant

West Coast Electronics Co. moved into a new plant at 5873 W. Jefferson Blvd., Los Angeles, for production of electronic components.

Potts Forms Junior Management Group

Horace T. Potts Co., Philadelphia, organized a junior management committee to guide operational policies and management of its steel warehousing and manufacturing business. Twelve men were selected from various divisions of the company to serve on the committee which will take over the operational management problems gradually, with the general partners continuing to guide the company in all policy matters, employee relations, and finance.

Philips-Palit Exports to India

Philips-Palit Corp. was organized by Arie Vernes, president, Philips Export Corp. and A. R. Palit, formerly head of the India Supply Mission in Washington. The company will engage in foreign trade between the United States and India and will have offices at 100 E. 42nd St., New York. It will concentrate initially on supplying heavy construction machinery, dump trucks, machinery and equipment for power projects, electronic equipment and equipment for chemical and oil engineering.

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Gondolas, Composite or All Steel, 50-Ton and 70-Ton
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Hoppers, All-Steel, 70-Ton, Cross Dump
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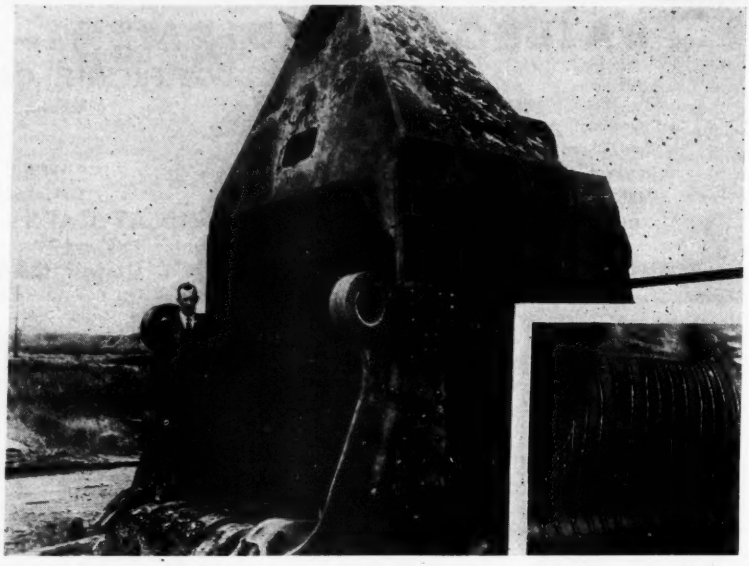

Beads on a Bucket

One approach to the problem of hard-surfacing bucket lips is seen on this Marion all-welded steel bucket used by the Sinclair Coal Co. In the inset, the underside of the lip is reinforced with a series of 16 parallel beads of Faceweld No. 12, a coated tubular arc-welding electrode high in carbides of tungsten, chromium, vanadium and molybdenum. It is made by Lincoln Electric Co.

Detroit Harvester Buys Auburn Firm

Detroit Harvester Co., Detroit, acquired all outstanding stock of Henry & Allen Inc., Auburn, N. Y. The latter company manufactures forgings and a complete line of agricultural cutting parts. The firm will be operated as a wholly-owned subsidiary of Detroit Harvester.

Meloon Bronze Consolidates Operation

Meloon Bronze Foundry Inc., Syracuse, N. Y., consolidated all operations at 1841 LeMoyne Ave., that city. The company has been operating a foundry at the LeMoyne avenue address and another on Sunset avenue. An addition recently was completed at the LeMoyne avenue plant.

Titeflex Appoints West Coast Agent

Titeflex Inc., Newark, N. J., manufacturer of electrical connectors, flexible metal hose and shielding conduit, waveguides and expansion-type bellows, appointed William Buckley as its West Coast sales representative with offices at Salesbury Corp., 1161 E. Florence Ave., Los Angeles.

Activity Gains in New Oil Field

Rapid development of oil drilling activity in the Williston Basin area prompted National Supply Co., Pittsburgh, to build a permanent store building at Williston, N. D. The area has been a busy one since oil was struck at Tioga, N. D., in April, 1951. More than 40 drilling rigs are in operation and this area may become a rich producing territory. J. W. Gillespie, Casper, Wyo., is division manager.

Allis-Chalmers Appoints Agent

Allis-Chalmers Mfg. Co., Milwaukee, appointed West Virginia Electric Corp., Fairmont, W. Va., as distributor for motors, controls, transformers, pumps, drive equipment.

Electrical Firm Moves Branch Plant

Ware Leonard Electrical Co., New York, moved its Los Angeles plant to 1605 E. Olympic Blvd. from 420 S. San Pedro St.

Link-Belt Building Colmar Plant

Link-Belt Co., Chicago, started construction of an engineering and manufacturing plant for the production of elevating, conveying and processing machinery at Colmar, Pa. Construction contract was awarded to the Austin Co., Cleveland.

Hallett Mfg. Buys Ruddock Co.

Hallett Mfg. Co., Inglewood, Calif., acquired Ruddock Co., involving expenditure of some $300,000 to house the company's new Aircraft and Missile Division. Ruddock's plant is adjacent to the Hallett facilities in Inglewood. A laboratory which will house over $100,000 in technical equipment is under construction.

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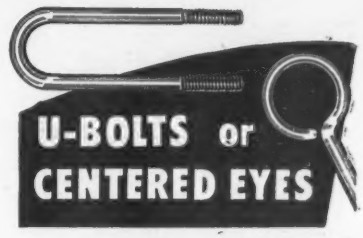

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